THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The iron market is quiet but strong. The persistently heavy consumption is the dominating fact that resists attempts to find weak spots, and though the market waits it does not droop, apart from the concessions reported on foundry iron. The situation between the machinery manufacturers and the machinists' union is at a stage indicating that the two organizations will not come together and that the settlement of existing troubles, conspicuously those at Chicago, Milwaukee, Cincinnati, Buffalo, Hamilton and Dayton, Ohio, Detroit and Minneapolis, will not be easy nor rapid. The machinists' union has regarded the declaration of principles of the manufacturers as a challenge and announces its readiness to fight. The meeting of manufacturers in New York reported elsewhere in this issue indicates that there will be no yielding of shop control by proprietors and no abandonment of the open-shop principle. The situation thus has some possibilities of a contest that would in time affect consumption, as it has done already in certain localities. The unsettled state of affairs in machine shops also affects the foundry situation. In Cleveland the molders have asked for an advance in the minimum from $2.75 to $3, which the foundrymen have refused, and a two-days' conference of officers of the National Foundrymen's Association and the Iron Molders' Union has resulted in disagreement. Settlements at Chicago, Cincinnati, Detroit and other points have been delayed awaiting the action of this conference. The situation at this writing is uncertain. The crop reports of the week were not so unfavorable as had been predicted, and no serious cutting down of consumption can be predicted on that score, unless the next month should bring serious disaster. The most interesting development of the week has been the purchases of Bessemer pig iron by the United States Steel Corporation. The company began by buying iron for June and July delivery, taking all the iron available for delivery before July 1 at $15.25. Purchases for the third quarter are under negotiations, with the probabilities that a round block of iron will be taken within a day or two. Considerable basic iron will be taken also. The situation in finished material is strong on all products except plates, and on these the lack of specifications is regarded as only temporary. The demand for sheets, wrought pipe, structural material and tin plates is particularly heavy. On tin plates it is considered probable an advance will be made at an early date, the price of imported plates having gone up recently.

PITTSBURG.

(Special Telegram.)

PITTSBURG, PA., June 12.—The United States Steel Corporation has placed contracts for 40,000 tons of Bessemer iron for delivery during the months of June, July and August. The bulk of this will, however, be shipped during the present month and in July. The price paid was $15.25 and $15.50 at the Valley furnaces. Part of the iron will be shipped from Bessemer Association furnaces and the remainder from outside furnaces. The price is somewhat above what was expected, but is in line with the outlined policy of the combination. To purchase iron at a lower price would mean a lower basis for finished material. How much iron will be bought for delivery during the last four months of the year can only be conjectured at the present time. With mills and furnaces operating as at present, it is believed that the United States Steel Corporation will require 100,000 tons for the remainder of the year in addition to the tonnage placed.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, June 12

It is believed the United States Steel Corporation will enter the market soon and will purchase a considerable tonnage of Bessemer iron. In the past week it has bought several thousand tons at $15.25 for June and early July delivery. According to the policy outlined the next buying will be for but three months ahead. This policy has been carried out during the brief existence of this corporation and there is every indication that it will be continued owing to the fact that the requirements of the many plants of the company vary from day to day. No definite information is available as to the company's wants for the third quarter, but some figures put them at 100,000 tons. In addition the United States Steel Corporation is reported in the market for considerable basic iron which will be placed before the end of the month. It is probable that the price for third quarter delivery will be fixed at $15 per ton at the furnace. Other buyers of Bessemer iron will shortly come into the market, the largest being the Crucible Steel Co. of America whose requirements for the second half are estimated at 45,000 tons. How large a tonnage the newly incorporated Ingot Mold Co. of America will require cannot be learned, owing to the many trade deals that are made with the steel plants for the casting of molds. However, it is believed that of the 100,000 tons of material that will be required annually by this company at least one-third will have to be supplied by the open market.

In finished lines the market continues quiet, with great strength shown in structural material, merchant pipe, sheets and tin plate. In plates, owing to the failure of a few large consumers to furnish specifications, the mills are fast catching up on their orders and deliveries can now be made within two weeks on new business. In structural material the mills of this district have orders booked two months ahead and in bars a considerable tonnage has been booked for second half delivery, although fully 100,000 tons remain unbooked and will be placed early in July. The large machinery manufacturers have also to place their orders for second half delivery, but from present indications they will not be in the market before August.

At the meeting of the plate manufacturers held in New York last week no change in prices was made except in the gauges less than ¼ inch, which were advanced from $1 to $3 per ton. With the recent considerable advances i.. the price of tin plate abroad it is believed that the American Tin Plate Co. will advance the price for delivery the fourth quarter. Domestic plates for delivery up to October 1 are selling at $4 per box, while the foreign product at present is quoted at $4.90, New York. The sheet market continues very strong and a number of the independent manufacturers have sold fully 50 per cent of their product for the second half. The combination on the other hand is said to be sold several months ahead. The National Tube Co. has made some marvelous records in sales thus far this year, and the business closed during May was second to the record breaking month of March, when the sales exceeded the output for the month by 25,000 tons. During the last month the sales exceeded the output by 15,000 tons. Thus it can be seen that the merchant pipe trade is greater and in better condition than ever.

Next week the first conference with the Amalgamated Association will be held. The bar iron scale will be first discussed, and the others will follow soon. The sheet and tin plate combinations are anxious to avoid the usual summer shutdown this year, owing to the big tonnage carried on their books, and it is probable that concessions will be made to bring about a settlement. The same holds true of the bar iron manufacturers who are not at all anxious to have their mills closed with a large amount of business on their books and in sight.

PIG IRON.—The Bessemer pig iron market continues in an unsettled condition owing to the failure of the United States Steel Corporation to specify the tonnage required for second half delivery. Until this is done most of the Valley furnaces, unless they are booked ahead on foundry and forge, are in the dark as to operations after July 1. It is understood that the United States Steel Corporation bought several thousand tons in the past week for delivery in June and part of July. These sales were at $15.25 at the furnace, and it is believed third quarter delivery contracts can be placed at $15 per ton. It is reported that the United States Steel Corporation will cover requirements for at least three months before the end of the week. If this is done it will go a great way towards strengthening the market. There has been little buying of foundry iron for future delivery and the few sales made were at prices ranging from $14.25 to $14.50. Several small lots of forge iron were sold in the week at $14, Pittsburg. We revise our quotations as follows:

Bessemer, Valley	$15 00 to $15 15
Bessemer, Pittsburg	15 75 to 16 00
No. 1 Foundry	15 00 to 15 25
No. 2 Foundry	14 25 to 14 75
No. 3 Foundry	14 00 to 14 25
Gray Forge, Pittsburg	14 00 to 14 25

STEEL.—The scarcity of steel billets which continues is considered by the trade as one of the best and surest barometers of the true market conditions. It indicates that the finishing mills are using nearly all the billets to be had. The few small lots that were sold during the week were placed at $24.75 to $25 at the mill. Open-hearth billets are altogether out of the market. Rods are quoted at $39 to $40 per ton.

FERRO-MANGANESE.—No change has been made in the price of manganese, domestic, 80 per cent and we continue the quotation of $58.50 per ton, delivered at buyer's mill.

MUCK BAR.—There is little demand for muck iron and we quote prime grades at $27 at mill, Pittsburg.

SKELP.—The pressure on the independent pipe mills is easing off somewhat and the demand for skelp is not so great as it was a month ago. Grooved and sheared steel skelp is quoted at 1.70c, while grooved and sheared iron skelp is held at 1.80c to 1.85c.

SPELTER.—The spelter market has increased in strength during the week and quotations are slightly higher. We quote prime western grades at 3.95c, Pittsburg.

RAILS AND TRACK MATERIAL.—The Fort Wayne Railroad has placed an order for 7,000 tons of rails with the Carnegie Steel Co. for delivery before the first of the year. Owing to the large amount of trolley line work projected a considerable tonnage of rails will be placed during the summer. Quotations are unchanged as follows: Standard sections, 50 pounds and over, in lots of 200 tons and over, $28; car lots and less than 200 tons, $30; less than car lots, $32; light rails, 8 to 12 pounds, $36 to $37; 16 pounds, $35; 20 pounds, $34; 25 to 40 pounds, $32. Track material: Spikes, 1.95c to 2c; track bolts, square heads, 2.60c; hexagon heads, 2.70c; fish plates, 1.60c to 1.70c.

PLATES.—At the meeting of the plate manufacturers held in New York last week the price of the lighter gauges was advanced. Plates 3-16 gauge were advanced from 1.65c to 1.70c, while 7 and 8 gauges were advanced to 1.75c and No. 9 to 1.85c. Nearly all the manufacturers reported that the large buyers are specifying slowly, with the result that mills are fast catching up on the specifications. Our quotations revised are as follows: Tank plate, ¼-inch thick up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. M. B. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c; and it ranges in price to 3c. Plates more than 100 inches wide, 5 cents extra 100 pounds. Plates 3-16 of an inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5 cents extra a hundred pounds for less than carload lots. Terms, net cash in 30 days.

BARS.—Little new business has been placed in steel bars during the week and the plow manufacturers who have not yet covered their requirements for the second half have not yet made inquiries. It is estimated that the tonnage yet unclosed amounts to 100,000 tons, which will be placed during the month of July. Bars in large lots are held at 1.40c, while small lots are listed at 1.45c. Common iron bars are quoted at 1.50c to 1.55c, while refined iron bars are held at 1.75c and upwards.

SHEETS.—The sheet trade continues in excellent condition and good business is being closed daily by both independent and combination mills. None of the manufacturers want a prolonged shutdown during the summer months and it is probable that the conference with the Amalgamated Association will be hurried to a settlement as fast as possible. Galvanized sheets continue firm and unchanged in price. We make the following quotations: Black sheets, one pass through cold rolls, No. 30, 3.65c; No. 29, 3.55c; No. 28, 3.35c; No. 27, 3.25c; Nos. 25-26, 3.15c; Nos. 22-24, 3.05c; Nos. 19-21, 2.95c; Nos. 17-18, 2.80c; Nos. 15-16, 2.70c; Nos. 13-14, 2.60c; Nos. 10-12, 2.50c. For more than carload lots a reduction of 5 cents per 100 pounds is made; for less than carload lots an advance of 15 cents per 100 pounds over the above price is asked. Galvanized sheets are held at 70 and 5 off.

PIPES AND TUBES.—The tonnage sold by the National Tube Co. during the month of May exceeded the output of the plants of the combination by 15,000 tons. During the month of March the tonnage exceeded the output by 25,000 tons, breaking all previous records. It is probable that there will be a short shutdown of the company's mills during the month of July. Discounts to consumers in carload lots, Pittsburg, are as follows:

MERCHANT PIPE.

	Carload lots. Black Per cent.	Carload lots. Galv. Per cent.	Less than carload lots. Black Per cent.	Less than carload lots. Galv. Per cent.
⅛ to ½ and 11 to 12 in.	59.2	46.2	54.9	40.9
¾ to 10 inches	66.7	53.3	61.9	49.9

BOILER TUBES.

	22 Feet and under. Per cent. Iron.	Steel.
1 to 1¾ and 2¾ to 5 inches, inclusive	43⅓	65⅓
2 to 2½ inches, inclusive	43	60
6 inches and larger	53	59

CASING.

	S. and S. Per cent.
2 to 3 inches	58
3¼ to 4 inches	63
4¼ to 12¾ inches	65

O. D. PIPE.

	Per cent.
14 to 22 isches	42
24 inches, o. d. and larger	37

THREADS AND COUPLINGS.

	Per cent.
14 to 16 inches o. d.	35

STRUCTURAL MATERIAL.—The mills in this district are carrying a tonnage on their books sufficiently large to keep in operation for at least three months. Little new business was placed during the past week. Prices remain unchanged as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles, from 3 to 6 inches, 1.60c; universal mill plates, 1.60c.

WIRE AND WIRE NAILS.—Jobbers report that the demand for wire and wire nails continues strong and that there is no indication in a falling off in demand. Prices remain firm but unchanged, as follows: Single carloads of wire nails to jobbers, $2.30, Pittsburg; to retailers, $2.40; plain wire, carload lots, is now quoted at $2.25 to jobbers and $2.35 to retailers; painted barb wire, $2.60, in carload lots to jobbers, and $2.70 to retailers; galvanized barb wire, $2 in carload lots to jobbers, and $3 to retailers. Cut nails are quoted at $2, Pittsburg, in carload lots, 2 per cent off in 10 days.

MERCHANT STEEL.—The buying of shafting has let up considerably during the past few weeks and it is not probable that much new business will be placed before August, when the large machinery dealers are expected to enter the market with a good tonnage. Our quotations unchanged are as follows: Turned, cold rolled and ground shafting at 55 per cent off for car lots and 50 per cent off for less than car lots; tire steel in carload lots and over, 1.60c; less than carload lots, 1.70c to 1.80c. Toe calk is held at 1.70c in large lots, and in small lots as high as 1.85c. Tool steel is held at 7c and up-

wards, according to quality; hoops and bands, 1.95c to 2c.

OLD MATERIAL.—The old material market continues quiet and buying is limited to small lots. There is a good demand for relaying rails, which are scarce. Prices are somewhat lower. We revise quotations, gross tons, as follows: Heavy melting stock, $16 to $16.25; low phosphorus melting stock, $17.50 to $18; steel rails, $16 to $16.50; busheling scrap, $13.50 to $14; No. 1 wrought, $17; iron rails, $18 to $19; cast borings, $7.50; cast scrap, $12.50 to $13.

COKE.—There has been a decided weakening in the coke market during the week and outside producers are quoting furnace coke at $1.60 per ton, while it is reported that concessions from $2 per ton have been made on Connellsville coke. Outside foundry coke is being offered at $1.90, while Connellsville coke has been sold at $2.35. The production of the Connellsville region for the month of May exceeded all previous records, amounting to 1,029,272 tons. There was a big slump in the production for the week ending June 1. The production for the week amounted to 212,078 tons, a falling off of over the production of the previous week of 21,350 tons. The shipments from the region also decreased nearly 500 cars.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
934 MONADNOCK BLOCK, June 11.

The general situation in iron and steel circles as regards present and future conditions is one of confidence, and the machinists' strike cannot be credited with having caused more than a ripple of uneasiness among manufacturers. Many shops and foundries in this city and contiguous territory are closed, but the manufacturers continue to demand prompt shipments on old contracts, indicating that they do not believe the labor troubles will be of long duration. Little new business is being placed for pig iron, and what few inquiries are made are mostly for carload lots and smaller quantities. The general opinion prevails that the pig iron market will be quiet this month. In all finished lines, we have to report the same heavy demand. Bids are being received by J. B. Clow & Sons for 1,200 tons of structural steel to be used in a building to be erected by them in this city. The wire trade is as active as heretofore, and local offices report that orders are now being placed for fall delivery. Sellers of merchant steel continue to book large orders from the agricultural implement trade, and there still remains quite a number who have not yet placed contracts for their year's requirements.

PIG IRON.—Business during the past week has been very light, the few orders placed being for carload and smaller lots. Foundrymen, however, insist upon prompt shipments under old contracts, indicating that they do not regard the labor situation as serious. In proportion to the quantity of pig iron sold, the demand for gray forge iron is heavy, quite a number of orders for this grade having been received in the last few days. We quote as follows:

Lake Sup. Charcoal	$17 50 to $18 00	Southern Coke No. 4	$13 90 to $14 15
Local Coke Fdy. No. 1	16 00 to 16 50	Southern No. 1 Soft	15 40 to 15 55
Local Coke Fdy. No. 2	15 50 to 16 00	Southern No. 2 Soft	14 90 to 15 15
Local Coke Fdy. No. 3	15 00 to 15 50	Southern Silveries	15 45 to 15 50
Local Scotch Fdy. No. 1	16 00 to 16 50	Jackson Co. Silveries	17 00 to 17 50
Local Scotch Fdy. No. 2	15 50 to 16 00	Ohio Strong Softeners	16 50 to 17 00
Local Scotch Fdy. No. 3	15 00 to 15 50	Alabama Car Wheel	21 00 to 22 05
Southern Coke No. 1	15 15 to 15 65	Malleable Bessemer	16 00 to 17 10
Southern Coke No. 2	14 65 to 15 15	Coke Bessemer	17 50 to 18 50
Southern Coke No. 3	14 15 to 14 65		

BARS.—Manufacturers report that the demand continues exceptionally good, orders coming from every branch of the manufacturing trade. While the aggregate tonnage booked during the past week is of favorable proportions, most of the orders placed are for 300 tons and less. We quote prices, 1.55c to 1.60c for iron, and 1.60c to 1.65c for steel. For current delivery, prices are slightly in excess of quotations.

STRUCTURAL STEEL.—Bids are being received by J. B. Clow & Sons for the erection of a building in this city which will require about 1,200 tons of structural material, the orders for which it is expected will be placed within ten days. Aside from this, there is no change in the situation as previously reported. We quote as follows for mill shipments, carload lots: Beams, 15 inches and under, 1.75c; 18 inches and over, 1.85c; angles, 1.75c to 1.80c; plates, 1.75c; tees, 1.80c; zees, 1.75c; small lots from store, ¼c higher; beams and channels from store, ½c per pound higher.

SHEETS.—Because the mills have been unable to satisfy the extraordinary demand for this material, the depletion of stocks in stores has been great. Owners of warehouses report that for many years past they have never experienced the heavy demand that has been made upon them in the last few months. Orders continue numerous and the prospects are that there will be no diminution for some weeks. We quote prices as follows: No. 27 black, 3.40c to 3.50c, and galvanized 65 and 10 per cent from store and 70 per cent and 5 per cent from mill, Pittsburg.

BILLETS.—The market for billets is quiet because manufacturers prefer to sell steel in finished products, and consequently are not soliciting business in this line. We quote open hearth billets, $35, and Bessemer billets, $30, Chicago.

RAILS AND TRACK SUPPLIES.—There is no change in the situation. The local seller has its capacity sold for the entire year. Many inquiries are being received and orders offered for delivery in 1902, but all are being refused. In cases where rails are urgently required, relaying rails are purchased and made to answer the purpose. Some orders for light rails have been booked, but the tonnage is not great as manufacturers cannot promise delivery within two to three months. There is no change in prices: Standard rails, $28; light sections, $31 to $33, out of store, $40 to $44; splice bars, 1.60c to 1.70c; spikes, 1.90c to 2c; track bolts, hexagon nuts, 2.80c to 2.90c; square nuts, 2.65c to 2.75c.

PLATES.—Most of the mills report that they can assure fairly prompt delivery in this material, the heavy buying in other lines being noticeable by its absence in the demand for plates. This does not indicate, however, that the business in this direction is or has been light. On the contrary, there is a steady demand, sufficient to keep the mills working on full capacity, and the total tonnage booked during the past week compares favorably with that of other weeks. We quote prices unchanged as follows: Mill shipments, Chicago delivery, base rate: Tank steel, 1.75c; flange steel, 1.90c to 2c; marine steel, 1.95c; firebox steel, ordinary, 2c to 2.10c; firebox, special, 2.25c and upwards. Tank steel from store, 1.90c to 2c; flange steel from store, 2c to 2.10c.

MERCHANT STEEL.—Manufacturers report some further contracts taken from the implement trade. It is not expected that the whole of this business will be placed before October 1, as there still remains quite a number of firms who have not contracted for their season's requirements. Prices remain as follows, mill shipments, Chicago delivery: Smooth finished tire steel, 1.90c to 2c; open-hearth spring steel, 2.50c to 2.75c; toe calk, 2.40c to 2.60c; sleigh shoe, 1.85c to 1.90c; cutter shoe, 2.40c to 2.60c; ordinary tool steel, 6c to 7c; specials, 13c and upwards. Cold rolled shafting, carload lots, 55 per cent and upward.

MERCHANT PIPE.—The business in this line is very heavy and mills are still behind in shipments. We quote manufacturers' prices unchanged, as follows:

MERCHANT PIPE.

	In carloads. Blk.	Galvd.	Less than carloads. Blk.	Galvd.
½ to ¾ inch and 11 to 12 inches	59.2	46 2	54.9	40 5
¾ to 10 inches	66.7	53 3	61.9	49 9

WIRE AND WIRE NAILS.—The local seller reports that orders are now being taken for fall delivery, this in advance of the usual time for shipment in this period. There is no lessening in the volume of business. We quote prices, unchanged, as follows: Carloads of wire nails to jobber, $2.40, Chicago; to retailers, $2.50; plain wire, carloads to jobbers, $2.35; to retailers, $2.45; painted barb wire to jobbers, carloads, $2.70; to retailers, $2.80; galvanized barb wire, carloads to jobbers, $3; to retailers, $3.10.

OLD MATERIAL.—The market has taken on a slightly healthier tone, but the buying is confined to preferred materials. It is not expected there will be any marked change in the conditions affecting the demand for old material until about the middle of July. Dealers' selling prices per gross ton are as follows:

Old iron rails	$19 00 to $19 50	Old Wheels	$16 00 to $16 50
Old steel rails, long	15 00 to 16 00	Heavy melting steel	13 00 to 13 50
Old steel rails, mixed	14 00 to 15 00	Mixed country steel	10 00 to 10 50
Relaying rails	20 00 to 22 00		

The following are selling prices per net ton:

No. 1 R. R. wrought	$14 00 to $14 50	Iron axles	$19 00 to $19 50
No. 2 R. R. wrought	12 50 to 13 00	Cast borings	4 00 to 4 50
Dealers' forge	12 00 to 12 50	Wrought turnings	9 00 to 9 50
No. 1 busheling	10 00 to 10 50	Iron axle turnings	10 50 to 11 00
Heavy cast	11 00 to 11 50	Steel axle turnings	9 50 to 10 00
Railway malleable	11 50 to 12 00	Stove plates	8 50 to 9 00
Country malleable	10 50 to 11 00	Old iron splice bars	16 00 to 16 50

CINCINNATI.

June 11.

In their weekly review of local and general conditions Rogers, Brown & Co. say: "Conditions in this territory show a slight improvement during the past week, traceable to increased inquiry for small lots for early delivery. Foundry iron buyers have received the major portion due on contracts covering the first half of the year and seem willing to cover their earlier needs by small purchases. Iron due on contracts is being called for, in some cases advance shipments being requested. The machinists' labor troubles are still unsettled, consequently this restricts the output of castings in this vicinity where so many machinists are employed. However, consumption is at a high level, particularly with the makers of agricultural machinery, who are enjoying a very good season. When the steel makers begin to cover their requirements in basic and Bessemer for the last half of the year it is probable that some of the foundry iron producers will enter that field. This may relieve the price situation to some extent by the restriction of output in foundry iron. Some sales of Bessemer are reported—the largest to the Colorado Fuel & Iron Co., approximating 35,000 tons, half of which will come from Southern and Central Ohio furnaces. No basic sales are reported."

We quote for cash f. o. b. cars Cincinnati: Southern coke, No. 1 foundry, $14 to $14.50; No. 2 foundry, $13.50 to $14; No. 3 foundry, $13 to $13.25; No. 4 foundry, $12.75 to $13; gray forge, $12.25 to $12.50; No. 1 soft, $14 to $14.50; No. 2 soft, $13.50 to $14; Lake Superior coke, No. 1, $15 to $15.25; No. 2, $14.75 to $15; Hanging Rock charcoal, No. 1, $20 to $20.50; Jackson Co. silvery, No. 1, $15.50 to $16; Standard Southern car wheel, $17.75 to $18.75; Lake Superior charcoal, $18.50 to $19.

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1004 ROSE BUILDING, June 12.

The statement of May shipments of iron ore from the Lake Superior region is only surprising in the size of the movement. With scarcely more than half a month of Lake Superior shipments the total to June 1 is found to be 1,689,775 tons, as against 3,265,888 tons to June 1, 1900—a falling off of 1,576,113 tons, or 48 per cent. When it is recalled that shipments began on April 20 last year, the performance of the ore fleet in a fraction of last month is noteworthy. It will be seen that in order to reach the total of 20,000,000 tons this year, which has been figured upon in some published forecasts, it will be necessary to bring down an average of more than 3,000,000 tons a month for six months. This would be a record performance, but it would not be impossible on that account, since the fleet of today is a record fleet. The situation at the Lake Erie end is the one that will control, and that in turn will depend upon the furnace interest. The docks are not in position to handle any great amount of unsold ore, and if anything like the total of shipments provided for in some estimates is brought down the ore must go forward to furnace yards. The buying thus far has been for but a partial year's supply and the point will soon be reached when the decision of furnacemen as to their additional purchases will be an important factor. And this in turn will depend upon the pig iron sales of the merchant furnaces for the second half. Of the most desirable old-range ores the unsold supply is not great, either in Bessemer or non-Bessemer, the United States Steel Corporation having taken up a considerable amount in the early purchases. In selling certain non-Bessemer Mesabi ores the Steel Corporation was credited with a broad policy, but the outside buyer may be rather circumscribed after all in his choice of ores if the big interest is to be a regular bidder for old-range material.

PIG IRON.—The Colorado purchases of Bessemer iron mentioned last week did not include any association iron. The United States Steel Corporation has been a buyer from valley furnaces, however, and in purchases of the past week amounting to several thousand tons has picked up all the remaining June iron and bought some lots for July shipment also. The price was $15.25 at valley furnace. No extended purchases for second half have been made, however. The foundry iron market is comparatively quiet, yet some business is being done with each week and the situation is strong underneath, shipments on contracts keeping up well, in spite of some strike interruptions. No. 2 foundry is sold at $14 to $14.25 in the Valley, gray forge at $13.50 to $13.75, chilled and basic at $14.50 to $14.75 at furnace, though some sales of the latter were made last month at $14.25 at furnace. We quote as follows:

Bessemer	$16 00 to $16 25	Valley Scotch No. 1	$15 25 to $15 75
No. 1 Strong F'dry	15 25 to 15 75	Valley Scotch No. 2	14 75 to 15 00
No. 2 Strong F'dry	14 75 to 15 00	Gray forge, Valley	13 50 to 13 75
No. 3 Foundry	14 25 to 14 50	LakeSuperior charc'l	17 50 to 18 0.

FINISHED MATERIAL.—There is a trifle better inquiry in some lines than in the preceding two weeks. A vessel calling for 1,800 tons of plates and shapes is about to be let and there is some advance figuring that indicates a good winter's work ahead for the lake yards. The plate mills are still able to make quite prompt deliveries. Some of them are well booked, but specifications are not all that could be desired. The activity in Texas oil fields has helped the boiler shops, all of which were quite busy before, and there is good inquiry for boiler steel. The quotation holds steadily at 1.70c, Cleveland, for tank steel. In structural lines there is some inquiry, the principal pending contract being that for the new Webster, Camp & Lane-Machine Co. buildings at Akron, O., which will require about 750 tons. There is a beginning of inquiry from Ohio agricultural machinery concerns for bars and plates and merchant steel. The possibility of a shut-down in some mills is no doubt responsible for some of the scattering business now coming in. We quote bar iron at 1.45c at Valley mill, steel bars at 1.50c, Cleveland, for Bessemer. The sheet mills, like the tin plate mills, are all heavily driven and prices are well maintained at 3.20c to 3.25c, Pittsburg, for No. 27, and 3.30c to 3.35c, Pittsburg, for No. 28. The pipe trade continues exceptionally strong and mills are being pushed to their fullest capacity.

PHILADELPHIA.

June 11.

The quietness which has hovered over the market for some weeks continues, nor is it likely that this will be removed until the general labor situation is cleared up. With this obstacle removed the prospects for a large volume of trade during the last half of the year would be excellent. Prices are without change though minor concessions are undoubtedly granted on desirable business.

PIG IRON.—Extreme dullness is shown and although stocks show no material increase, it is not believed that any large amount of orders will be placed without a shading of current quotations. The extent of this reduction is uncertain, but it is unlikely it will exceed 25 or 50 cents a ton. Sellers show a disposition to grant concessions on heavy requirements for long delivery and the buying movement may be expected to start in strongly as soon as the horizon is cleared of the uncertainties now prevailing. We quote for seaboard delivery or at near-by points as follows: No. 1 X foundry, $16 to $16.25; No. 2 X foundry, $15 to $15.50; No. 2 plain, $14.50 to $14.75; standard gray forge, $14 to $14.25; ordinary gray forge, $13.50 to $13.75; basic (chilled), $14.25 to $14.50.

FINISHED MATERIAL.—Prices being mostly controlled by pooling arrangements, there are no changes to record, nor is there likely to be until the controlling interests decide that this is desirable. Some large projects appear to be held back pending adjustment of complications in different localities. There is a great deal of unfinished work on hand, and the demand for small and medium sized lots continues fair, and in some lines, as for instance sheets and structural material, it is even difficult to secure prompt delivery. The following prices are for Philadelphia delivery: Plates, ¼ inch and thicker, 1.75 to 1.80c; iron bars, 1.55 to 1.65c; steel bars, 1.62 to 1.70c; angles, 1.75c to 1.85c; beams and channels, 1.75 to 1.85c.

OLD MATERIAL.—This section of the market shows some weakness, though the changes in prices are not important. Quotations are about as follows: Choice railroad scrap, $19 to $20; No. 1 yard scrap, $14 to $15; No. 2 light scrap, $13 to $14; machinery cast, $13.50 to $14.25; heavy steel scrap, $16 to $16.25; old iron rails, 19 to $20; old steel rails, $15.75 to $16; wrought turnings, $11.50 to $12; cast borings, $8.25 to $8.75; old car wheels, $17 to $18; old iron axles, $21.50 to

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The Mutual Wheel Co., Moline, Ill., has increased its capital stock from $75,000 to $150,000.

NEW OFFICERS OF THE A. F. A.

John G. Sadlier, President.

J. G. Sadlier, of Springfield, O., vice president and general manager of the Springfield Foundry Co. and the Fairbanks Machine Tool Co., who was elected president of the American Foundrymen's Association at the Buffalo convention last week, is self-graduated from the molding floor. As a boy of 12 he entered the foundry of the Cambria Iron Co. at Johnstown, Pa., and there served his apprenticeship. He was born at Johnstown in 1856. As an apprentice it was his ambition to become one of the foremost molders in the United States, and he has worked assiduously to realize his ambition. Previous to his location at Springfield, O., Mr. Sadlier was employed as foreman in the foundries of the Morgan Engineering Co., at Alliance, O.; the Walker Manufacturing Co., Cleveland;

JOHN G. SADLIER.

Wm. Tod Co., Youngstown, O., and the Sharon Steel Co., Sharon, Pa. He has been a member of the American Foundrymen's Association from its organization and has always taken an active part in the discussion of the practical questions that have come up at its annual conventions.

Thomas D. West, Treasurer.

Thomas D. West was born in Manchester, Eng., Aug. 31, 1851. His mother was a Faraday, a cousin of Dr. Michael Faraday. In his first year he came with his parents to New York. At eight he lost his father and two years later was taken into the foundry by his step-father, Andrew Baird, a Scotch molder. This was at Portland, Me., the works being those of the Portland Locomotive Co. Early in his experience as a molder Mr. West was given charge of important heavy work, and for several years worked in shops building engines and saw mill machinery. He worked later in the Morgan Iron Works, New York, Novelty Iron Works, New York, and at Providence and Norwich, Conn. A few years later Mr. West entered the foundry of the Globe Iron Co., Cleveland, being engaged on steamboat cylinders and other heavy machinery castings. He was foreman for over a year in the Wm. Tod & Co. foundry at Youngstown, but returned to Cleveland to become manager of the Variety Iron Works foundry. Mr. West and a partner built a shop in Cleveland in 1887. It was burned down in 1892 and the rebuilt shop was located at Sharon, Pa., the T. D. West Foundry Co. being organized to make a specialty of ingot molds, from 70 to 100 tons of castings a heat being turned out.

Mr. West's industry as an investigator in foundry practice and his voluminous contributions to foundry literature are well known on both sides of the water. He has been very

THOMAS D. WEST.

active in foundry association work and the American Foundrymen's Association's standardized drilling bureau originated with him.

P. Werner, who for some years has been with the Edward P. Allis Co., has accepted the position of chief engineer and general superintendent with the Filer & Stowell Co. In this position he succeeds Arthur Niedermeyer, now superintendent of the Buffalo branch of the Allis-Chalmers Co. and also follows W. F. Brown and Pelle Anderson of the recently organized Brown-Corliss Engline Co. Mr. Werner is a native of Sweden, where in various schools, colleges and shops he received a thorough education as a mechanical engineer. He is a graduate of the Stockholm Institute of Technology. In this country he has held several positions as a draughtsman and designer; first at Philadelphia, then at Drifton, Pa., and finally with Edward P. Allis Co. In the latter position he was entrusted with the design and construction of such notable engines as those for the Metropolitan Street Railway Co. and the Manhattan Railway Co. of New York. The last mentioned are the largest stationary engines for the generation of electricity ever attempted.

The Sargent Co. of Chicago, held an election of officers on May 29 which resulted as follows: Geo. M. Sargent, chairman board of directors; W. D. Sargent, president; H. K. Gilbert, vice-president and treasurer; Day McBirney, secretary. This company is planning a considerable extension to its works at Chicago Heights, Ill.

The Crucible Steel Co. of America is now considering the erection of a large number of finishing mills at Blair Station, the location of its three new blast furnaces and 12-furnace open-hearth plant. What the nature of the mills will be has not yet been definitely decided.

It is reported from Youngstown, O., that the resignation of Henry Wick as president of the National Steel Co., to take effect July 1, was due to a disagreement with officers of the United States Steel Corporation concerning the removal of the offices of the former company to Youngstown, O. A five-year lease of a building at Youngstown had practically been concluded, but it is stated now that the plan has been abandoned.

THE IRON TRADE REVIEW

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JUNE 13, 1901.

REPEAL OF THE TIN PLATE DRAWBACK.

At the recent annual convention of the Amalgamated Association of Iron, Steel and Tin Workers at Milwaukee, important action was taken in the decision to petition Congress for the repeal of the drawback on tin plate. The separate lodges of the association were authorized to petition their respective Congressmen with this in view, and no doubt this agitation will result in the presentation of a repeal bill at the coming session of Congress.

So far as the Amalgamated Association is concerned the motive for this action lies on the surface. Inasmuch as the tin plate mills of this country cannot place all the tin plate workers, the aim is to increase the consumption of domestic tin plate, and bring about the erection of additional tin mills to take care of the idle workers. Of course it is immaterial to the Amalgamated Association whether the large importers of tin plate who take advantage of this drawback privilege build the additional mills, or whether they are built by the United States Steel Corporation or independent manufacturers.

Naturally any effort to repeal this drawback feature will be contested by such large manufacturers and exporters as the Standard Oil Co., Armour & Co. and other packers, to say nothing of the dealers in tin plate who import the Welsh product. Estimating the total production of tin plate in this country at the present time at 900,000,000 pounds annually, the repeal of this act, forcing the large purchasers of foreign tin plate to purchase their tin plate in this country would increase the domestic consumption fully 15 per cent, inasmuch as the drawback was allowed on 125,269,156 pounds of tin plate during the year ending June 30, 1900.

The tariff on tin plate is 1½ cents a pound and a drawback is allowed of 99 per cent. With 100 pound boxes of coke plates selling at $4 per box, for example, the manufacturers who secure the benefit of this rebate owing to the exportation of their products contained in cans and boxes manufactured therefrom, are purchasing their tin plate at $2.51½ per box. However, there has been a decided advance in the price of foreign plates which are now selling at $4.90 per box, delivered at New York, increasing the net cost per box of re-exported tin plate to $3.51½. Never in the history of the American tin plate industry have the manufacturers been enabled to compete with the foreign manufacturers with this drawback taken into consideration and the indications are that they never will be able as long as the rebate remains at 1½ cents per pound.

Whether the Standard Oil Co. would erect its own tin plate mills should this rebate be taken off is problematical, owing to its close relations to the United States Steel Corporation. When this matter came up in connection with the Dingley tariff bill in 1897 the Standard Oil Co. threatened to become a formidable factor in the tin plate trade if tin plate manufacturers pressed the drawback repeal, and this more than anything else was the cause of the retention of the proviso in the tariff act of that year.

The importation of tin plate for domestic consumption is falling off rapidly, only 11,792,801 pounds having been imported in 1899 and for the year ending June 30, 1900, the consumption was increased to 17,329,441 pounds, owing to the crowded condition of American mills, making deliveries very uncertain. Within the past few months advances have been made in the price of foreign tin plate making it almost prohibitive for domestic consumption. With 100 pound boxes selling at $4 in this country at mill and a price of $4.90 for the foreign product at New York it can be readily seen that American purchases for domestic consumption will not prefer the foreign product to the American. Below are given figures showing the importation of tin plate upon which drawbacks were allowed since 1884 and also the imports for domestic consumption upon which no drawbacks were returned by the government:

DRAWBACK TIN PLATES.

Year ended June 30.	Pounds.
1884	97,415,089
1885	127,125,903
1886	136,539,316
1887	123,203,627
1888	108,271,542
1889	166,087,740
1890	150,112,007
1891	149,599,649
1892	119,928,083
1893	128,863,227
1894	161,758,361
1895	126,777,800
1896	137,659,779
1897	139,246,130
1898	137,897,570
1899	122,906,682
1900	125,269,156

TIN PLATE IMPORTS FOR DOMESTIC CONSUMPTION.

1884	430,466,232
1885	378,433,173
1886	437,559,089
1887	447,439,762
1888	523,952,754
1889	561,858,232
1890	524,552,451
1891	908,111,852
1892	283,102,702
1893	484,816,763
1894	275,022,352
1895	407,737,107
1896	247,414,509
1897	105,161,472
1898	34,013,656
1899	11,792,801
1900	17,329,441

Convention of Machinery Manufacturers.

(Special Telegram.)

NEW YORK, June 12.—An important convention of the National Metal Trades Association and of other machinery manufacturers began its sessions yesterday at the Gilsey House. Its outcome will be far-reaching in its bearing upon the machinists' strike. President Edwin Reynolds, of Milwaukee, called to order at 10:30 a. m. and announced the decision of the administrative council to exclude from the convention all representatives of the press. The session, in attendance and spirit, was well worthy of the important interests at stake and the harmony of action was most gratifying to the members of the Association.

Delegates were present from Milwauke and South Milwaukee, Wis.; St. Louis, Mo.; Chicago, Quincy and Moline, Ill.; New York, Brooklyn, Tarrytown, Seneca Falls, Elmira, Newburg, Buffalo, Watertown, Rochester, Sandy Hill, N. Y.; Cleveland, Cincinnati, Mt. Vernon, Hamilton, Youngstown, Columbus and Dayton, O.; Erie, Philadelphia and Scranton, Pa.; Boston, East Boston, Chicopee Falls and Worcester, Mass.; Hartford, Stamford, Ansonia, Derby, Bridgeport, New Britain, New Haven, South Norwalk, New London and Torrington, Conn.; Minneapolis and St. Paul, Minn.; Detroit, Saginaw, Bay City and Muskegon, Mich.; Paterson, Harrison, Elizabeth, Newark, Elizabethport, New Brunswick, Plainfield and Ampere, N. J.; Denver, Col.; Toronto, Can.; Seattle, Wash.; and Portland, Ore. George Fredericks represented the Metal Trades Association of the Pacific coast. Fully one-half the delegates were not members of the National Metal Trades Association, but all were in harmony with the resolutions adopted at Chicago last month, and action endorsing them was taken at yesterday's meeting.

The administrative council had prepared a statement of the agreement made with the officers of the International Association of Machinists at New York in March, 1900, and the manner in which it was ignored by President O'Connell. The fact that the International Association of Machinists has seen fit to violate its contract to arbitrate any and all matters of dispute is deemed a just and sufficient reason why further faith cannot be placed in the responsibility of the machinists' union. After the statement that the matter of wages is purely a local and not a national issue the position of the association is defined as follows: "We declare that the machinists' union has, through its national and local officers, broken faith with us and proved to be an irresponsible body, with whom we can make no contracts that will be binding upon them.

"We recognize the right of any man to belong or not to any religious, political or economic sect, as he may see fit, also his right to leave our employment at his free will, and his right to sell his labor at the best price he can command. We maintain our inalienable rights to employ a man whether he belongs or not to any organization and at wages mutually satisfactory, and also to discharge him at our discretion. We insist that the management of a shop is in the hands of the employer and is not to be interfered with by the employe.

"We insist that a fair day's work shall be given for a fair day's wage, and we will give a fair day's wage for a fair day's work.

"We believe that a shortening of the working hours or an increase of wages can only be brought about by the hearty co-operation of employer and employe in advancing and not in retarding production and by introducing and not fighting improved methods.

"We decry strikes and lock-outs as unbusiness-like and unnecessary and believe that all disagreements can be adjusted by other means and the condition of employer and employe both benefited more by harmonious progress than by strife and discord."

This recital of facts and declaration of principles was submitted to the members and adopted. The following resolution was also unanimously adopted:

"The visiting delegates not members of the National Metal Trades Association here present representing manufactures eligible to become members, hereby pledge themselves to the declaration of principles adopted at Chicago May 28 and 29, 1901, which declaration has been submitted to the delegates assembled."

A new set of by-laws and an amended constitution was submitted by the council of administration and with a view to the incorporation in them of the best judgment of the convention they were referred to a committee of ten, consisting of five members and an equal numbers of guests. Article 2, section 3, is added and states the third object of the association, namely, "to resist unfair and unjust demands of organized labor and to preserve to the American mechanic freedom of employment."

It is proposed to extend the membership somewhat and the third article was finally submitted in this form: "Regular members shall be persons, firms or corporations engaged as principals owning or controlling plants operating principally in the metal trades in which are employed machinists, millwrights, blacksmiths, boiler-makers, pattern-makers, carpenters, structural iron-workers, iron shipbuilders, polishers and buffers, brass workers, including brass molders, sheet iron workers, electrical workers, machine operators and helpers to any of the above. Associate members shall consist of local associations of metal-working concerns as defined above and such local associations may be represented in this body by one delegate for each ten members of such local association. The voting power of the membership shall be confined to regular members except as hereinafter provided and shall depend upon the number of operatives. Each regular member shall have the right to cast one vote for every ten operatives as shown by the last quarterly report. Delegates representing the associate membership may take part in discussions, but shall have no vote except by the consent of a two-thirds vote of the regular members present at the meeting. Associate members shall pay no assessments, dues or initiation fees, nor shall they be entitled to participate in the protective benefits of the association."

The above, in accordance with the constitution, will be submitted to the membership for one month.

After a recess at noon the delegates again assembled at 2:30 Tuesday afternoon and continued in session until evening. An adjournment was then made to Wednesday morning, when the further reports of the committees will be taken up for action. Committees were appointed as follows: Resolutions—N. B. Payne, Elmira, N. Y.; J. W. Gardner, Quincy, Ill.; Geo. F. Steedman, St. Louis; S. W. Watkins, Milwaukee; and W. J. Chalmers, Chicago. Convention—H. N. Covell, Brooklyn; Geo. T. Bliss, Erie, Pa.; W. M. Taylor, Indianapolis; E. C. Lufkin, Buffalo; P. D. Kendig, Seneca Falls, N. Y. Revision of Constitution and By-laws—Ferd. Schwedtmann, St. Louis; Wm. Schwanhauser, Brooklyn; H. N. Covell. Finance and Strikes—Wm. Schwanhauser, J. W. Young, Chicago; S. W. Watkins, H. N. Covell; Geo. T. Bliss, Erie, Pa.; N. B. Payne, Elmira; W. D. Sayles, Cleveland; Mr. Gilbert, Detroit; J. Kirby, Jr., Dayton, O.

Conference on the Iron Scale.

The first conference between the manufacturers and the conference committee of the Amalgamated Association will be held in Cleveland Tuesday, June 18. The Republic Iron & Steel Co. will be represented by Col. Watson G. French, general manager; W. E. Taylor, J. C. Corns, and James H. Nutt, and the American Steel Hoop Co. by General Superintendent I. W. Jenks and Assistant Hilton Coombs.

New Sheet Mill at Ashland, Kentucky.

The Ashland Sheet Mills Co. has been formed at Ashland, Ky., by interests identified with the Ashland Steel Co., and will at once erect a sheet mill on the Ohio river front, a site of about 15 acres above the Norton Iron Works having been secured. The new company is capitalized at $250,000. The directors are T. J. McCullough, Dresden, O.; A. J. McCullough, W. H. McCullough and Geo. McCullough, Zanesville, O.; B. H. Burr, Ironton, O.; Ironton A. Kelly and Thomas M. Adams, Ashland, Ky. Ironton A. Kelly was elected president; T. J. McCullough, vice president; L. R. Putnam, secretary, and Geo. McCullough, treasurer. The Messrs. McCullough will be active in the management of the company. President Kelly continues as president also of the Ashland Steel Co., whose Bessemer steel plant and rod mill at Ashland are running at full capacity.

Pennsylvania, Cambria and Bethlehem Steel Companies.

The week has been full of statements and counter-statements, some of them official and some only conjecture, concerning the Cambria Steel Co., the Pennsylvania Steel Co., and the Bethlehem Steel Co. The announcement was made in these columns last week of the sale to the John Lowber Welsh syndicate, of Philadelphia, of a controlling interest in the Pennsylvania Steel Co. It was stated at the same time that there were indications that the Cambria Steel Co. was connected with the deal. Concerning the Bethlehem Steel Co. there were opposing statements. But the inference from the negotiations in progress was that the Pennsylvania Steel and the Cambria Steel Companies were at least to be operated under a community of interest arrangement and that harmonious relations with the United States Steel Corporation would be maintained.

The important event of the past week in connection with these plans is the formation of the Conemaugh Steel Co. Application for a Pennsylvania charter will be made on July 1. The incorporators are Powell Stackhouse, John W. Townsend, R. Francis Wood, David Reeves, Effingham B. Morris, John Lowber Welsh and Edward T. Stotesbury. All are officers or directors of the Cambria Steel Co. Mr. Morris is likewise a Pennsylvania Steel Co. director. Messrs. Welsh and Stotesbury are on the Bethlehem Steel Co. board of directors, but both deny that this company is concerned in the new Conemaugh company. The circular to Cambria Steel Co. stockholders, setting forth the plans of the new company, shows that the Conemaugh Steel Co. is merely a vehicle of reorganization and that the business is to be continued under the name of the Cambria Steel Co. President Stackhouse, of the Cambria company, has issued this statement:

"It is proposed to organize a corporation under the laws of Pennsylvania with an authorized capital of $50,000,000, divided into 1,000,000 shares of the par value of $50. Of this capital, $5,000,000 will be reserved; $45,000,000 will be presently issued. Of the $13,050,000 resulting from the sale of the 580,000 shares of Conemaugh stock, $11,680,000 will be applied as follows: In payment of the existing debt of the Cambria Co., $3,500,000; to construction work undertaken, $1,500,000; for new furnaces, ovens, mills and water works, $5,500,000; for additional working capital, $1,180,000. The balance goes to pay the commissions, $200,000, and as compensation to the underwriting syndicates, $1,170,000."

Pennsylvania Railroad a Possible Factor.

A Philadelphia dispatch of June 11 says that the Pennsylvania Co. has secured control of the Pennsylvania Steel Co. with the purpose of manufacturing its own rails and that the Sparrow Point plant of the Maryland Steel Co. would be utilized as a shipbuilding plant for the International Navigation Co. The report is not confirmed.

The Bethlehem Steel Co. Deal.

Repeatedly in the week the report has been telegraphed and commented upon as a fact, that President Schwab of the United States Steel Corporation has purchased control of the Bethlehem Steel Co., being a successful bidder against the Vickers-Maxim Co., whose deal for the Bethlehem interests has been alternately reported as off and as concluded, in the past ten days. The report that Mr. Schwab has taken the property on his own account and not for the United States Steel Corporation has been widely accepted; but it is understood that this is only preliminary to a final disposition of the plant, of which no definite details can yet be announced.

In the month of May the *Railroad Gazette* reported orders for 13,505 cars and 192 locomotives. These figures are compared with 9,786 cars and 99 locomotives ordered in the corresponding month last year—a big increase, and one that has been shown each month this year. The May car orders are divided as follows: Box, stock and refrigerator cars, 8,490; coal and ore cars, 3,035; flat cars, 1,610; tank cars, 113, and passenger cars, 257.

PLOW MANUFACTURERS' COMBINATION.

(Special Telegram.

CHICAGO, ILL., June 12.—Representatives of some of the leading plow manufacturers have been in session at the Auditorium Annex in this city for the past two days planning details for the proposed plow manufacturers' combination. The result is that a company will be formed between now and July 1st with a capital stock equal in amount to the actual net assets of the different concerns entering into the combination with an additional working capital of $5,000,000. It is estimated that the preferred stock will be $35,000,000 and the common stock $40,000,000. At the meeting yesterday it was decided to admit the valuation of the constituent companies at the time of the last inventory of each in 1900. This arrangement provides that the business done by the different companies since that time will be the business of the new company. All the concerns will be shut down July 1st and an inventory will be taken by the Audit Co. of New York. The books of the different concerns will be standardized. No name for the new company has been decided upon as yet, though they are under advisement as follows: The American Plow Co., The American Implement Co., and the Consolidated Plow Co. One of these will be chosen. The headquarters of the company will be in Chicago. Between now and July 1 another meeting will be called at which officers and directors will be elected. It is understood that Charles H. Deere, of Moline, Ill., will be chairman of the executive committee. On the board of directors will be one from each firm in the combination and two or more directors represented New York money interests. George W. Young, president of the United States Mortgage & Trust Co., will probably be one of the directors and Judge William Vincent, the promoter of the combination, another. None of the stock will be offered for public subscription, all the money required having been raised by capitalists interested in the Mutual Life Insurance Co. of New York and the Equitable Life Insurance Co. of the same city.

The following companies will be absorbed by the new company: Pekin Plow Co., Pekin, Ill.; Grand Detour Plow Co., Dixon, Ill.; Bradley Mfg. Co., Chicago, Ill.; Bucher & Gibbs Mfg. Co., Canton, O.; Stoddard Mfg. Co., Dayton, O.; Syracuse Chilled Plow Co., Syracuse, N. Y.; Avery Plow Co., Louisville, Ky.; Deere & Co., Moline, Ill.; Deere & Mansur Co., Moline, Ill.; Union Malleable Iron Co., Moline, Ill.; Rock Island Plow Co., Rock Island, Ill.; Morrison Mfg. Co., Fort Madison, Ia.; Bettendorf Metal Wheel Co., Davenport, Ia.; Fuller & Johnson Mfg. Co., Madison, Wis.; Gale Mfg. Co., Albion, Mich.; Sattley Mfg. Co., Springfield, Ill.; South Bend Chill Plow Co., South Bend, Ind.; Peru Plow Co. Peru, Ill.

Cleveland Conference on Molders' Wages.

Five conferees from each side met in Cleveland Monday, June 10, and continued their sessions into Tuesday night, in the endeavor to agree on a minimum wage for machinery molders in Cleveland for the year beginning July 1. There were present on behalf of the molders Martin Fox, Joseph F. Valentine, David Black, James S. Flanagan and M. P. Murphy. Representing the founders were the following officers of the National Founders' Association: President H. W. Hoyt, Allis-Chalmers Co., Chicago; Vice-President A. C. Pessano, Geo. V. Cresson Co., Philadelphia; Geo. Q. Thornton, Carondelet Foundry Co., St. Louis; R. D. Reed, H. B. Smith Co., Westfield, Mass.; O. P. Briggs, Twin City Iron Works, Minneapolis. The molders asked for an advance in the minimum from $2.75 to $3 a day. The foundrymen contended that conditions did not warrant an advance, and particularly that the uncertainties of the situation due to the machinists' strike made any change at this time impossible. The conferees separated Tuesday evening with the matter in exactly the same state as at the opening of the conference. A similar demand, it is understood, is pending in Chicago and other points in Central territory, but the Cleveland conference was on the Cleveland situation only.

The Belle City Bolster Spring Co., Racine, Wis., contemplate erecting a new factory at a cost of $30,000.

HOWARD AXLE WORKS AT HOMESTEAD.

The Howard Axle Works of the Carnegie Steel Co., of which illustrations are here given, is located in West Homestead and is a department of the Homestead Steel Works. Ground was broken in April, 1899, and the first axle forged on April 23, 1900. This plant was designed for an output of 1,000 car axles per day. The expectations have been more than realized, for a record of 1,300 axles per day has been made with two heating furnaces. It is estimated that when the third furnace now under construction is finished 1,500 axles per day will be produced. The furnaces, yard billet conveyor and rolling mill were designed by the Garrett-Cromwell Engineering Co.; the mill engine was furnished by the Bass Foundry & Machine Co., with cylinders 24 inches and 46x60 inches. The plant is equipped with six Morgan Engineering Co. electric traveling cranes of 10 tons capacity.

FIG. 1.—FORGING SHOP, HOWARD AXLE WORKS, HOMESTEAD, PA. CAPACITY, 1500 AXLES PER DAY.

The process of manufacturing a car axle at these works may be summarized as follows: The billets are delivered to the lower end of the main building, where the cars are unloaded by electric magnets attached to the traveling cranes. The stock is then sorted and held ready for use. The billets as needed are placed on the conveyor by the magnet and thence by the rollers carried to the charging end of the furnaces, which are of the Garrett-Cromwell continuous type. The hydraulic pusher is then operated and moves the whole charge of 50 billets and throws down one billet at a time on to the hearth where it is allowed to soak until required by the hammers. A system of colored electric signals is used to keep the hammers supplied.

The drawing from furnaces is done by hydraulic discharging machines which push the billets out on to the let down devices and then to the tables, which carry them to the continuous rolling mill. This is a 24-inch mill with five graded passes for different sized stock. A switching device is arranged to guide the billet in the proper pass, the two continuous passes changing the rectangular billet into a round blank, thus greatly reducing the work at the hammers. The blanks are then carried on a roller table to the hammers and are delivered by means of switches at each hammer. The switches are operated by a hydraulic cylinder from a pulpit. The blanks are handled at each hammer by self-supporting jib cranes, one on each side.

FIG. 2.—STRAIGHTENING AND FINISHING SHOPS, HOWARD AXLE WORKS.

There are ten hammers of 7,000 pounds capacity, built by Bement, Miles & Co. After the axles are forged they are placed on cooling racks and thence are taken by electric trav-

eling cranes to the presses, of which there are three. After being straightened the axles are transferred to the cut-off and centering lathes. They are then taken to the wheel seat and journal lathes, unless they are to be rough-turned all over, when they are taken to the center lathes. There are 28 cut-off and centering lathes, 16 wheel seat and journal lathes, and eight center lathes, all being driven by electric power. The axles are handled at the lathes by pneumatic hoists. When the machining is done they are placed on transfer cars and pushed to the loading shed, where they are laid out for inspection of surface defects and dimensions. A small furnace outside of main building is used for getting out short orders.

The boiler plant consists of ten 250 h.-p. Cahall boilers equipped with Mansfield chain grates. Coal and ash handling machinery was built by the McMyler Mfg. Co. The feed water is treated and filtered by the Wefugo process. The electric power plant consists of two 400 k. w. Westinghouse generators, direct connected, one driven by a Buckeye engine, the other by a Westinghouse gas engine. The hydraulic plant consists of two Worthington duplex pressure pumps,

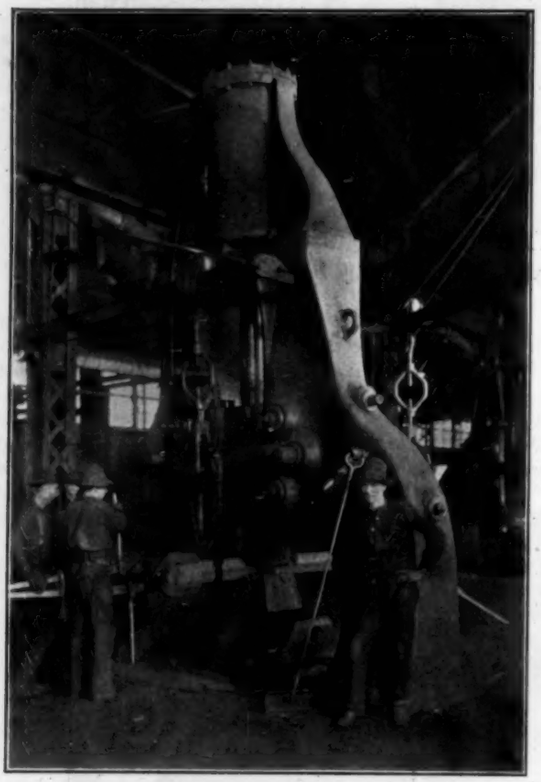

FIG 3.—VIEW OF ONE OF THE TEN 7,000-LB. HAMMERS IN FORGING SHOP.

12x4¾x12 inches, with a 16-inch x 8 ft. accumulator. There is one central Weiss condenser for the whole works. At the water works there are two Worthington duplex compound pumps of 750,000 gallons capacity per day. There are also machine, blacksmith and carpenter shops for necessary repairs to the plant.

The Rand Drill Co., New York, has installed another air compressor in the Chicago shops of the Chicago Rock Island & Pacific Railway. This makes five Rand compressors in use in these shops, one 8x12 inches, two 12x16 inches and two 16x24 inches.

Mr. J. C. Halladay, formerly sales agent with the Chicago Pneumatic Tool Co., has been appointed general Western sales agent for the Protectus Co., of Philadelphia, with offices at 532 The Rookery, Chicago.

The Electric Wheel Co., Quincy, Ill., manufacturers of wheels for agricultural implements, will shortly commence the erection of a $30,000 plant.

DRAWING-ROOM AND SHOP SYSTEMS.*

BY FREDERICK O. BALL.

This is a presentation of the methods in use by the American Engine Co., and the paper is provided with a number of reproductions of shop tracings, reference standards of nuts, screws, studs, etc., and sheets showing labor costs and blue print records. The fundamental principle of the systems is that everything pertaining to the construction of the machines must originate in the drafting room and that everybody in the shop, including foreman and pattern makers, must be guided solely by the lists and orders emanating from that department. The designing being done in the drafting room, that department should be made to assume the responsibility not only for the general design of the machines built, but for every part needed to make up a complete machine; and as the drafting room is without question the proper place to keep records of the machine being built it is quite evident that the machines should be built entirely according to its orders, so that the records may be accurately kept. It is advisable for tracings that only one piece be shown on each; that if a piece requires several views all should not go on the one tracing, and that drawings be made to as small a scae as lpossible.

Owing to the inevitable distortion of certain castings, some require more allowance for finish than others and the author suggests a system of finish marks to apply to tracings according to experience with the castings in the machine shop.

A method is provided for keeping a record of where the different patterns are located, their foundry sheets, and the system for ordering castings. When a tracing is made of a piece requiring a pattern, the name is entered in the pattern book next to the number selected for it. This pattern number is then entered on the tracing, and the tracing number is entered in the pattern book in the proper place.

The paper carefully explains the use of the systems in vogue at the shops of the American Engine Co., in the handling of blue-prints, tracings, patterns and castings.

40,000 Tons of Steel a Month for Steel Cars.

With every day a large shipment of steel cars is made by the Pressed Steel Car Co., of Pittsburg, which now has on its books orders sufficient to keep the 10,000 men on its pay rolls busy for some time. In the last week of May, 400 hopper coal cars, similar to the 600 cars built and shipped to them during the early part of the year, have been ordered by the Chesapeake & Ohio Railway. Another order received in the same period was from the Algona Central Railway for 50 ore cars of 120,000 pounds capacity. Including the cars built during May, 1901, the total number of cars shipped since the industry began four years ago is 40,578. At the present rate of production, the company will build this year nearly as many cars as have been constructed since its inception. During May the total number built and shipped was 2,705, an average of a little over 100 cars for every working day. This average has been kept up for several months now and the company's officials believe that in the future it will be even greater. What this means can be better realized when it is known that in addition to the cars built by this company, there is a large output of bolsters, truck frames, center plates, brake beams, etc., and that in May alone the consumption of steel amounted to over 40,000 tons. With this amount of steel plates and steel structural material, 13 steamers 500 ft. long, 50 ft. beam and 50 ft. deep could be constructed.

The first plate representing a lot of Krupp armor manufactured for the United States Navy by the Bethlehem Steel Co. was tested last week at the Indian Head proving grounds and was a failure. The first projectile fired at the plate caused it to crack while the second bulged the plate badly. Examination of the plate indicated that it did not possess the required toughness of back so necessary to the best results. The plate was selected by the government inspectors at the Bethlehem Iron Works because it represented the worst in the group. Another plate in this lot will be tested and if it also proves defective the entire lot will be rejected.

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*Abstract of paper read at Milwaukee meeting of A. F. M. E., May, 1901

Buffalo Convention of the American Foundrymen's Association.

The sixth convention of the American Foundrymen's Association, held at Buffalo, N. Y., June 4-6, was without doubt one of the most successful yet held by that organization, both from an educational and social point of view. Despite the many attractions offered by the Pan-American city, the attendance at none of the sessions fell below 100, and a majority of the papers were read and fully discussed. The entertainment features provided by the Buffalo Foundrymen were varied and were thoroughly enjoyed. The attendance was estimated at nearly 300, and at none of the previous conventions were there as many ladies present—a feature to be still further encouraged at future conventions. The meetings were held in the hall of the 74th Regiment, National Guard of New York, Armory, one block from the Niagara hotel, which was the general headquarters.

TUESDAY AFTERNOON.

In our last issue the proceedings of the opening session held on Tuesday morning were fully reported. The afternoon session opened with an address by Senator H. M. Ramp of Missouri on "Benefits of the American Foundrymen's Association as Viewed by an Outsider." The speaker referred at length to the great benefits that have accrued from the organization of foundrymen in this country and Canada, which has been beneficial not only to the foundryman, but to the molder and shopmen as well. "It has proved," he said "that the foundrymen must co-operate with one another to secure the best results, and cut-throat competition, which existed before the organization of this association, when each foundryman guarded his plant with the utmost care, lest some improvement he had hit upon should become known to his competitor, has received its first wound in the organization of this association. To obtain the best results the foundryman has learned that an interchange of ideas with his competitors is a good thing. He is learning what they are doing; they are learning what he is doing, and the mutual benefits derived are too great to be measured by dollars and cents. On the other hand, the men in the foundry have also benefited. They have learned that supply and demand must regulate trade and are not rushing into strikes as heedlessly as before." Senator Ramp closed his remarks by extending an invitation to the association to hold its convention in 1903 at St. Louis, Mo., when the exposition, which is already in progress of construction, will be held. His remarks were warmly received.

Titanium in Cast Iron.

The paper on the "Influence of Titanium on Cast Iron," by A. G. Rossi, of New York, N. Y., was not read, but was discussed by the author. The speaker contended that owing to the inroads steel castings are making in the cast iron field, something must be done to give cast iron something of the strength possessed by steel, and he urged that as a strengthener nothing is better than titanium. As an alloy for strengthening purposes he believed it more desirable than nickel.

Albert L. Colby, metallurgical engineer, of the Bethlehem Steel Co. of South Bethlehem, Pa., took issue with Mr. Rossi on account of his comparison of titanium with nickel, and said that the Bethlehem Steel Co. has made more experiments than any other steel company in the world with various metals for the purpose of strengthening steel, and the high quality of steel obtained had amply justified the addition of alloys. "I am willing and am able to sustain what Mr. Rossi has said of the deposits of titaniferous ores in the Adirondack region," said Mr. Colby. "From experience I have found it more plentiful than game. Mr. Rossi, however, offers us no figures on the cost of this titaniferous alloy which he wishes to be added to iron and steel for the purpose of improving the physical properties. From experience I have found that it is hard to mix this alloy with iron and steel on account of the difference in specific gravity, whereas nickel and iron are very readily combined. To show the marvelous results obtained with nickel as an alloy, I have with me two photographs, copies of which were sent to the exposition in Glasgow. (The photographs were passed among the members.) The one photograph is that of a nickel steel rifle barrel bent to a U shape, and which possessed the following physical properties:

Tensile strength lbs. per sq. in.	Elastic limit per sq. in.	Elongation per cent in 2 in.	Contraction of area.
115,100	99,810	23	64
114,080	97,750	23	64 95
114,590	99,820	22	65 45
116,620	96,770	22.5	62.05
116,120	97,780	23	64
114 590	98,800	24	62.53

"The other photograph is that of nickel steel shafting and gun tubes made by the Bethlehem Steel Co. possessing the following physical properties:"

Tensile strength lbs. per sq in.	Elastic limit lbs. per sq. in.	Elongation per cent in 2 in.	Contraction of area, per cent.
Shafting.			
100.000	68,000	20	59.7
102,370	68,240	25	58
Gun Tubes.			
113,000	72,800	20	38.8
112,490	72,610	25	57 4

The Problem of the Molder.

John G. Sadlier, of Springfield, O., followed with a paper on "The Problem of the Molder," which was in large part as follows:

"The heaviest casting in modern times, of which we have a record, is an anvil block cast in Russia some 25 years ago, the weight of which is said to be 550 tons. The heaviest casting made in America is an anvil block for the hammer at the Black Diamond Steel Works in Pittsburg. Next to this is the steel cylinder of the large hydraulic press for armor plate at the Carnegie Works at Homestead, weighing 140 tons.

"Although there have been a number of large and excellent castings made in this country, yet the progress in this direction has not kept pace with the advancement in others. In the last fifty years the advancement in machinery construction has been so rapid that it appears almost phenomenal. From the old-time operating hand machine we have come to the improved automatic machines, which almost cover the entire range of manufacturing where there is a great number of one kind of piece to be produced. The foundry alone appears to stand very nearly where it stood years ago. The reasons to be assigned for this we would divide into two classes:

"First, the increase of specialists. It seems to be the aim and object of many proprietors to teach their apprentices or beginners to make one piece, and when they succeed in making that satisfactorily, to keep repeating the operation from year to year as long as they will stay in their employ. In many cases the apprentice becomes tired of this state of affairs and seeks employment elsewhere; and if he secures it and is able to hold his position at all, he will be given the most inferior and simple work in the shop for the reason that he has probably been tried on something better, and has failed to give a satisfactory result. Once he has been relegated to what is known as the side floor in a shop, it is very difficult for him to get a change. The result is he will never rise above a third or fourth-class mechanic.

"The second and great reason for the slow advancement of the foundry is found in the peculiar characteristics of the business itself. There is nothing in mechanic arts that requires more thought, more skill, and more practice. In all the other trades and professions there are rules, tables, gauges and fixed and systematic order, that can be and are applied to the different requirements; besides these a great amount of literature well and ably written, giving full and detailed instructions as to the quickest, safest and best method of accomplishing certain results. Tables on strengths, tables

on pressure, tables on measurement, and many others that are used are the result of ages of experience and practical test. All these fall short when you come to apply them to molding, as that is learned almost entirely by the sense of feeling, a sense which can not be transmitted to another, nor can it be transferred to paper. It is something that must be acquired by actual practice. The sense of touch plays such an important part in the construction of a mold, that without it it is impossible to construct a mold with any reasonable expectation of success. Feeling of the sand indicates its proper temper, its adhesive qualities, and as to its porosity. Then in ramming, the molder's sense of feeling should be trained to such a degree that he can tell at every stroke of the rammer whether he struck the bottom with sufficient force to ram the sand to stand the strain of the iron, or to prevent it from crumbling if dried, or to lift well in those parts which are to be raised off. The material handled by the molder is of a very delicate nature, and is easy to disarrange through a very slight mistake in any way. Then again, the iron delivered to him is very frequently too dull to make clean, sound, perfect castings, and consequently his labor is all in vain.

"Many of the mistakes in the machine shop are overcome by fitting another piece to the one that has been spoiled, as in an error in measurement. In the foundry, a slight mistake or oversight will cause the entire day's, and sometimes the entire month's, work to go to the scrap pile. A mistake or oversight here can not be seen in time to correct, consequently the molder is looked upon as careless and indifferent. He has probably made two molds from one pattern as near alike as possible; the casting from one will be a beautiful thing to look at, and the other will probably be a mis-shapen, ungainly candidate for the scrap pile.

"Before starting a boy in the shop as a full-fledged apprentice, I would ask my colleagues in the foundry business to take this applicant for foundry honors on a probation of, we will say, three months, during which time he should be continually under the eye of the foreman, or his assistant, and watched very carefully without interfering or in any way coercing his action. If he exhibits an inclination to learn, is industrious, and becomes thoroughly interested he should be assigned some slight duty that would make him profitable. At the end of the probationary period, make a contract with him for three years and nine months, giving him the benefit of the three months as a novice. If at the end of three months' probation he does not seem inclined nor interested, it would be a kindness to the boy to request him to try something else.

"I do not believe that molders are born and not made, but I will say that unless you have the material in the individual to make a molder, you can not possibly accomplish anything. After he has been accepted and regularly indentured, then it becomes very much the duty of the foreman to see that he will become a competent man and a good mechanic.

"The boy starting in on his first piece feels a certain amount of excitement and interest which should be cultivated and kept alive. He should not be scolded, cowed or bully-ragged for a slight mistake, but should be encouraged by a few kindly spoken words, as there never was a brow-beaten and cowardly apprentice who made a first-class molder. It is by implanting the spirit of "I can" and "I will" in the heart of an apprentice that you obtain the best results. What I mean by a cowardly apprentice is not the boy who will be afraid to knock his shopmate down for an insult, nor to resent harsh words, or ill treatment, but the one who is afraid of losing the casting he undertakes to make. I believe there are more castings lost through an over-anxiety to make the work correct than from carelessness or any other cause. Every shop should have one or more first-class journeymen whom the apprentice should be encouraged to take as his model, so far as possible. Yet it is necessary to encourage originality after a certain period. The apprentice should be encouraged to be self-reliant, and be advanced as he succeeds in making good and satisfactory work. The older molders should not be allowed to stand in the way of advancing the apprentice to the very best work in the shop, if he proves himself able to turn it out satisfactorily.

"The apprentice should further be encouraged to interest himself in all the details of the foundry practice, the character o. the sand best suited for the different classes of work, and also the different brands of iron that go into the mixtures for different grades of castings. In fact he should be taught that the mixing of the metal and cupola practice is second only to the making of the mold itself. The character of the coke, the height of the melting point in the cupola, the regulation of the blast, the temperature at which the iron is melted, and the grading by fracture and other methods; all these he must be shown to have the greatest bearing on the finished casting.

"The time spent in the education of the molder's apprentice in all points of foundry practice pertaining directly to the making of the casting, is one of the best investments any foundry manager can make, for it is the apprentice, well educated in these matters, who makes the first-class molder."

In the discussion of the paper, E. H. Walker, of Boston, said that in many shops of the country the molder is becoming a specialist. This is especially true, he said, in the large shops where a molder is required to do only one line of work and nothing else, learning one process only.

Mr. Sadlier added the following: "The molder employed in American foundries is degenerating. I am talking from experience, having spent many years as a molder in the foundries of this country. It seems to me that the molder of today is not required to have nor does he have the same knowledge of molding as was possessed by the craft 15 or 20 years ago. They are retrograding into a class of specialists, and a molder that can do general founding is hard to find. I say that this lack of knowledge on the part of the molder is largely blameable on himself, inasmuch as, after he has served his time in one shop on one kind of work, he goes out and calls himself a molder. By no means is he a molder: he is a specialist. I think on the other hand that the foundryman is also guilty. He keeps a molder on one kind of work if he shows aptitude for it, with the result that the molder gets no general training. Even in this age of specialization, a certain percentage of general molders will be required in the shops of this country, and unless something is done to educate the apprentices in our shops, the loss of this class of molders will be largely felt.

S. Groves, of Pittsburg, heartily concurred in the remarks of Mr. Sadlier, and said that it would pay any foundryman, and would pay him well, to give the apprentices an opportunity of helping on first-class work and to instruct their molders to help them in every way possible in the work on the foundry floor.

Manganese in Cast Iron.

Thomas D. West, of Sharpsville, Pa., next presented his paper on "The Influence of Manganese on Cast Iron." [It will be printed in a later issue.—Ed.] It was briefly discussed by Mr. A. L. Colby, of South Bethlehem, Pa. He said: "The advantages of manganese in foundry pig iron may be summarized as follows: It adds strength as it raises the combined carbon. It adds fluidity. It increases density, as it removes gases producing blow holes, and also makes a more uniform grain due to a more regular distribution of graphite, so that in machining you obtain the advantage of a much more uniform grained material to work on. Manganese is especially advantageous when presented in a high silicon iron, for it makes a soft, dense, strong casting. I am glad to see Mr. West call attention to the disadvantages of adding manganese as ferro-manganese or spiegeleisen. He says in his paper: 'Another point shown comes from the manganese placed on the molten metal in the ladle. Here we find that an increase of .19 in the percentage of manganese has made no difference in the contraction and a variation of but .033 in the depth in the hardness test. This shows that the addition of manganese in the ladle tends to increase the hardness, which is contrary to what we have generally been led to believe by writers in the past. We are not confined to this one test to modify views of the past on this point, as the same result is also shown in heats No. 4, 5 and 6. However, when we get to low silicon irons, as in heats No. 7 and 9, we find that manganese in the ladle is very effective in throwing out graphitic carbon, or softening the iron, and very sensitive as it produces radical changes in these points. In regard to the effect of manganese on the strength of cast iron, its tendency

as shown is to make iron stronger. In adding manganese to molten metal, the iron should never be dull, but as hot as practicable, in order that all the manganese may be melted in such a manner that a homogeneous mixture may result. Where iron is dull, a fracture may often show little bright spots or grains of manganese alloy that did not melt and mix properly with the iron. In such cases more harm is done than good.'

"For this reason the Bethlehem Steel Co. has made a maganiferous pig iron containing 1 to 1.5 per cent of manganese and high in silicon. While this convention of the American Foundrymen's Association is no court in which to quote prices of pig iron, I can certainly offer to practically give it away."

Foundry Equipment and Foundry Management.

A comprehensive paper on "The Foundry and Its Equipment" was read by Edward B. Gilmour, of Milwaukee, Wis. The paper was printed in our last issue. It was discussed at length, and the education of the foundry foreman was touched upon. Mr. West said that he believed that the day is not far distant when the foreman of the foundry will also be a chemist, and that his technical training will far exceed that of the present. He advocated a school in foundry practice for the education of foundry foremen and superintendents, and believed that foremen should be so educated that the proprietor of the foundry will be enabled to discuss with him matters pertaining to the operation of the foundry in a manner that will be beneficial to the proprietor.

J. A. Lanigan, of Lawrence, Mass., did not favor the suggestion made by Mr. West that foundry foremen should be chemists, inasmuch as a man in preparation for such a position would be compelled to spend his best years in school. H. McPhee, of Bridgeport, Conn., concurred in the remarks made by Mr. West in favor of a better training for foundry foremen, and hoped to see the day when a school of some kind will be established for them.

President Jones blamed the present condition of affairs on the shortcomings of the apprenticeship system. "We have no way of holding the boys in our foundries. They commence to work for us to learn a trade and when they have gained a little knowledge they leave because they have been offered a little better pay elsewhere, and the result is that they do not become thorough molders. There is not the incentive today to make the full-fledged molder. But do not misunderstand me. We are surpassing the world today, not with the best mechanics but with the best specialists. These two points are to be taken into consideration in the discussion of this question. In Chicago today there is a large manufacturing establishment where the apprenticeship system is almost down to perfection, to my mind. The boys after serving their time there are urged to seek employment elsewhere in order that they may learn how operations are carried on in other shops, and after considerable such experience can always return to the shop in which they served. They have gained knowledge in other shops and return with all this wide experience for the benefit of their employer."

C. S. Bell.—In the foundry of today we have introduced the molding machine. This reduces the proportion of skilled men required and takes away the molder's interest. The result is that he is only a part of the machine which he operates. We take in boys and if they show a proficiency on a certain line of work we keep them at it. I must say with emphasis that we are greatly indebted to the shops that are making our mechanics. To say that there are no better molders today than there were 25 years ago is wrong. Today they do things in the shop that they were not able to do only a few years back. However, we must remember that machines and specialists are bound to make machine men.

The paper on "The Control of the Foundry," by Percy Longmuir, of Sheffield, Eng., was read by title, after which the meeting was adjourned.

Excursion to Exposition and Niagara.

On Tuesday evening the visitors were the guests of the Buffalo foundrymen at the Pan-American Exposition. A special train conveyed the guests to the grounds.

At 10:15 Wednesday morning the visitors left on a special train for Niagara Falls. A band was engaged for the day and concerts were given on the train to and from the Falls. At noon an elaborate luncheon was served at the International Hotel. After lunch Willis Brown, of Erie, Pa., was introduced as toastmaster, and he called on a number for impromptu remarks. Later the company adjourned to the portico of the hotel, where a group photograph was taken.

WEDNESDAY EVENING.

At the session on Wednesday evening President Jones announced that he had appointed the nominating committee as follows: B. M. Shaw, Boston, Mass.; T. J. Best, Montreal, Quebec; William Yagle, Pittsburg, Pa.; C. J. Wolff, Chicago, Ill.

A memorial on "The Grading of Pig Iron" from the Pittsburg Foundrymen's Association was presented by Thomas D. West. Dr. Richard Moldenke also served on the committee with Mr. West, and after the reading of the memorial, a vote of thanks was extended to both for the work they did in its preparation. It is as follows:

Memorial On the Grading of Pig Iron.

Gentlemen:—The undersigned, a committee appointed by the Pittsburg Foundrymen's Association, March 6, 1901, to urge the adoption of a more uniform system of grading pig iron, by analysis, on the lines suggested by Mr. Thos. D. West in a paper published by this association in March, 1901, sent out circular letters to the trade during the latter part of March, asking the following questions:

1. Do you approve of the establishing of more uniform methods for grading pig iron by analysis?

2. Do you endorse the method outlined by Mr. West's paper?

3. If not, please state your opinion as to what division of silicon, sulphur, etc., you think best in the grading of pig iron, and state what views you hold on this subject which you would like to have considered at the convention.

The large number of replies to this inquiry received show that there is a desire for the establishment of more uniform methods and that over two-thirds of those answering the inquiries favor the adoption of the system advocated by Mr. West. However, it is but natural to expect an expression of different opinions, and several other methods have been advocated. Then again, some replies indicate that the exact purport of Mr. West's paper was not understood, though copies of it were enclosed with the circulars. We quote the following extracts from some of the replies received:

A prominent furnaceman replies that he endorses the method but not Table 2, and further says "The sulphur in high silicon iron, Mr. West's No. 1 iron should have a wider range. He has no grade which corresponds to 2.50 Si. .06 S. The sulphur in 1, 2, 3, 4 and 5 have too narrow limits. .01 to .02 sulphur is too low to be considered in grading."

A chemist of a large iron, coal and coke company replies: "I think Mr. West in numbering his grades from 1 to 10 and with Si. and S. in the ratio given in Table 2, has hit a system that ought to be generally adopted. I heartily endorse his paper and his system of grading."

A reply from a leading pig iron dealer says: "We think your sulphur guarantees are too stringent. Why not make the sulphur guarantee in all Foundry iron .05 and under. That is our practice now when we sell by analysis and we find it proves satisfactory."

A well-known foundryman and writer says: "Mr. West's suggestions strike me as a good practical solution of a matter which needs immediate attention."

A large iron and coal firm replies: "We heartily approve of the idea of a standard system invariably producing the same conditions of analytical proportions for the same grades. But we think your grades have started with sulphur a little lower than average in pig iron now on market."

A prominent and influential founder, after answering questions 1 and 2 in the affirmative, says: "We notice you suggest 10 grades in iron, beginning the No. 1 with 2.75 to 3.00, and making a new grade for each .25 decrease in silicon. Is so close a grading practical or necessary? How do you propose to grade the higher silicon irons?"

A prominent chemist of a large engine and machinery man-

ufacturing concern says, in answer to question 2: "Consider it too complicated. Would advocate purchases of iron to be regulated by a limit of minimum silicon and maximum sulphur. The adoption of standard methods is in line with other work of the association and would be of no slight value to its members."

A general founder answers Yes to question 1, and No to question 2, and says: "Graphitic carbon makes the grade. Sulphur influences the carbons and silicon is mostly a remedy for sulphur evils. Don't it cost more to produce high carbon (graphite) than high silicon? Grade by an essential element, not by a medicine that has become essential due to lack of this element. Carbon analyses take time. If we could get them with every car of iron there would be less trouble than when depending on silicon."

A superintendent of an iron and steel works answers Yes to the first question and to the second, "Not entirely," with the following comments: "How will you grade iron over 3 per cent silicon, which is our heaviest run? What will you do with iron whose sulphur limits do not fit the table or will you determine its grade for the available silicon contained? i. e., per cent silicon less per cent sulphur increased by 10. It is impossible to run test bars for every cast, but the physical properties ought to be considered, especially the hardness. Carbon should be specified and fracture neglected even though any one brand of iron will always run within the fixed limits of carbon and independent of fracture."

A prominent sales agent says: "The above (referring to inquiry No. 2) is the only correct way and the best method for all concerned."

A charcoal furnaceman says: "It should be the pride of every furnaceman to establish high standards and maintain them for the different numbers."

A large well-known furnace company says: "Ultimately as now the grading so far as the furnaces are concerned will have to be according to such standards as their customers demand."

E. H. Walker, of the J. I. Case T. M. Co., sends specifications under which they purchase their irons, and adds that he hopes we will be successful in establishing more uniform methods in grading pig irons.

S. B. Marshall, chemist of the Dunbar Furnace Co., says: "I think Mr. West has the right idea, but he wants too many grades, which is sure to cause more or less trouble. It would be better to have fewer grades and to have a sliding scale for each grade, which would enable you just as well to suit the different demands of customers for their varieties of work required. Enclosed find a paper with a synopsis of my ideas." Mr. Marshall's suggestions are as follows:

A SYSTEM OF GRADING PIG IRON BY ANALYSIS BASED ON A "SLIDING" SCALE FOR SULPHUR AND A MINIMUM LIMIT FOR CARBON.

"Softeners" 3.00 silicon, under .050 sulphur (sliding scale.)

	Silicon with Sulphur.			Silicon.		Sulphur.
				1.70	with	.010
				1.80	"	.013
No. 1 Foundry Iron	1.70	"	.010	1.90	"	.016
	to		to	2.00	"	.019
	3.00	"	.050	2.10	"	.022
				2.20	"	.025
				2.30	"	.028
				2.40	"	.031
				2.50	"	.034
				2.60	"	.037
				2.70	"	.040
				2.80	"	.043
				2.90	"	.046
				3.00	"	.050

Total Carbon over 3.20
Graphitic " " 2.75
An increase of .10 Silicon for every .023 Sulphur.

	Silicon with Sulphur.			Silicon.		Sulphur.
				1.20	with	.005
				1.30	"	.010
No. 2 Foundry Iron	1.20	"	.005	1.40	"	.015
	to		to	1.50	"	.020
	2.20	"	.055	1.60	"	.025
				1.70	"	.030
				1.80	"	.035
				1.90	"	.040
				2.00	"	.045
				2.10	"	.050
				2.20	"	.055

Total Carbon over 3.00
Graphitic " " 2.50
An increase of .10 Silicon for every .005 Sulphur.

	Silicon with Sulphur.			Silicon.		Sulphur.
				.70	with	.005
				.80	"	.010
No. 3 Foundry Iron.	.70	"	.005	.90	"	.015
	to		to	1.00	"	.020
	1.70	"	.055	1.10	"	.025
				1.20	"	.030
				1.30	"	.035
				1.40	"	.040
				1.50	"	.045
				1.60	"	.050
				1.70	"	.055

Total Carbon over 2.75
Graphitic " " 2.00
An increase of .10 Silicon for every .005 Sulphur.

	Silicon with Sulphur.			Silicon.		Sulphur.
				.50	with	.025
				.60	"	.030
Grey Forge.	.50	"	.025	.70	"	.035
	to		to	.80	"	.040
	1.50	"	.075	.90	"	.045
				1.00	"	.050
				1.10	"	.055
				1.20	"	.060
				1.30	"	.065
				1.40	"	.070
				1.50	"	.075

Total Carbon over 2.00
Graphitic " " .075
An increase of .10 Silicon for every .005 Sulphur.

The following is the division into grades which was suggested by Mr. West:

	No. 1 Iron.	No. 2.	No. 3.	No. 4.
Silicon	2.75 to 3.00	2.50 to 2.75	2.25 to 2.50	2.00 to 2.25
Sulphur	.01 to .02	.01 to .03	.01 to .03	.01 to .05
	No. 5.	No. 6.	No. 7.	No. 8.
Silicon	1.75 to 2.00	1.50 to 1.75	1.25 to 1.50	1.00 to 1.25
Sulphur	.02 to .04	.02 to .05	.03 to .05	.03 to .06
	No. 9.	No. 10.		
Silicon	.75 to 1.00	.50 to .75		
Sulphur	.04 to .07	.04 to .10		

The president of a large corporation operating several blast furnaces writes as follows:

"In establishing standard grades, the grades to be determined by varying percentages of silicon and sulphur, the variation of only 0.25 per cent of silicon and 0.01 per cent of sulphur is calculated to give rise to endless friction between the Blast Furnace Company and Foundry Customer. The conditions of foundry work would not seem to call for so great a refinement, thus rendering the extra expense and trouble unnecessary.

"In the hands of average good chemists, working on the same sample of borings, differences of 0.25 per cent silicon and 0.01 per cent sulphur or more are of not unfrequent occurrence. Check analyses of the same chemist will occasionally show this variation, due possibly to the personal equation, as well as to variations in the chemicals used or preparation of sample. Analyses of different sets of borings from identically the same pigs, with equal care and skill on the part of chemists will often vary more than the difference shown between No. 1 grade and No. 2 grade, as suggested in scale, even when same methods of analysis are used. It is assumed that the Furnace Company employs a competent man as chemist, on whom implicit reliance can be placed. It is only fair that the chemist in the employ of consumer should be considered as worthy of the same confidence, else he would not be employed, notwithstanding that many inexperienced and careless young men are found in laboratories.

"In the effort to introduce an improved system of grading and arrive at a standard that will be generally acceptable, care should be taken to avoid causes for friction and disputes, due to differences arising from conditions that are apparently unavoidable, assuming that the chemists of maker and user are equally experinced and reliable.

"Based upon our experience of the past five or six years, I would suggest that the different grades of foundry iron be distinguished by greater variations in silicon and sulphur contents, as, for example:

	Silicon.	Sulphur.
No. 1	2.50 to 3.00%	0.03% maximum or under.
No. 2X	2.00 to 2.50	0.03 " " "
No. 2 Soft	2.50 to 3.00	0.04 " " "
No. 2 Plain	2.00 to 2.50	0.05 " " "
No. 2 Strong	1.50 to 2.00	0.05 " " "
No. 3	1.50 to 2.50	0.10 to 0.05
etc.	etc.	etc.

"The retention of the names of grades as commonly known to the trade would doubtless be of advantage, in reducing opposition to the introduction of a standard system or until consumers generally become familiar with the distinguishing features of the several grades as determined by composition."

What is given in this summary should be sufficient to demonstrate that there is a very earnest desire by the trade in general to see established more uniform methods for grading pig irons by analysis and that the time is ripe for definite action. If it is thought that the method of grading suggested above by Mr. West is too rigid or close for present times, then something more liberal might be adopted. However, something should be done that would end one furnace calling a .50 per cent silicon iron No. 1 while another calls a 4.00 per cent silicon iron No. 1 also. We believe it desirable to have a committee appointed which can formulate a standard method for grading pig iron by analysis and report at the next convention. We would therefore urge that it be

Resolved, That in view of the urgent demand for a modern system of grading pig iron, a committee be appointed to look into this question and report thereon at the next convention.

THOS. D. WEST,
RICHARD MOLDENKE,
Committee.

Discussion By Alfred Ladd Colby.

Mr. Colby presented the following discussion of the memorial and of the paper by Mr. West before the Pittsburg Foundrymen's Association, which called it out:

"The author, Mr. West, first calls attention to what he terms 'the present erratic method of grading pig iron,' and deduces the graphic statement given by him in Fig. No. 1, by selecting the different silicons quoted for No. 1 iron in Mr. Seymour R. Church's book entitled 'Analyses of Pig Iron,' published in San Francisco in May, 1900. As Mr. Church's compilation includes analyses of iron used for making Bessemer steel, acid open-hearth steel, basic open-hearth steel, muck bar, and in fact every use to which pig iron is put, Mr. West's graphic statement does not truly represent the variations in silicon quoted by Mr. Church for No. 1 pig iron intended solely for foundry purposes.

"I do not mean to insinuate, however, that if a compilation of silicons in No. 1 foundry iron (including charcoal, coke, and anthracite iron) were made, as wide differences as shown in Mr. West's graphic statement would not be found. I think, however, that the fallacy of buying foundry pig iron by the present system of grading by fracture could have been more clearly brought out by Mr. West if he had shown the variation in chemical composition of different shipments of any one foundry iron, produced at a certain furnace and sold to a foundry as No. 1 iron at different times covering a period of say two years. This method would have eliminated the many variables due to difference in fuel (charcoal, coke, and anthracite); also variables due to the ore and flux, as well as the size of the furnace, size and shape of pigs, etc., all of which exercise an influence on the appearance of the fracture of the iron, and would have clearly proven that even under the most uniform conditions, a No. 1 iron varies in chemical composition.

"As this difference in the chemical composition of the same grade of iron, produced at the same furnace, is known to every intelligent furnaceman, it is very likely that the furnaceman put his best foot forward in quoting the analysis of his No. 1 iron, in answer to Mr. Church's circular letter, for he naturally saw the opportunity for a gratuitous advertisement, and it is only natural to expect that any compilation from such data would show erratic and wide variation, especially when pig iron used for all purposes besides foundry was included in the comparison.

"The present method of grading pig iron by appearance of fracture is based, as is well known by every theoretical and practical man, on the proportion of the total carbon present in the graphitic form; a very open grained iron, called by some 'No. 1x,' contains at least 3.50 per cent graphite, whereas what is known in the trade as 'white' iron contains perhaps not over .50 per cent graphite. Some foundrymen, realizing that the different makes of 'No. 1 iron' vary widely in their percentage of combined carbon, and wishing a very uniform iron for an important class of castings, have issued specifications in which the percentage of combined carbon is limited. One such specification is as follows:

Combined carbon, not over	.40%
Silicon	2.25—2.75%
Phosphorus	.50— .90%
Manganese, not over	.80%
Sulphur, not over	.04%

"The Bethlehem Steel Co., with which the speaker is connected, offered to the customer originating this specification a machine cast foundry pig iron meeting the specification, except, of course, the combined carbon, and it was represented to the customer that although the chilling of our iron during the operation of machine casting had converted a larger proportion of the carbon into combined carbon than if the same iron had been cast in sand, as easily machined a casting could be produced by remelting our machine cast iron, containing about 1.00 per cent of combined carbon, as by remelting a sand cast iron containing the percentage of combined carbon specified, namely not over .40 per cent.

"The following experiment was immediately undertaken to prove the truth of the above assertion. We had at the time one of our blast furnaces on foundry iron of about 3 per cent silicon. Arrangements were made for casting one-half of a cast of this foundry iron in sand, and the other half was taken in ladles to our casting machine. Equal quantities of drillings from six pigs selected from different parts of the portion of the cast which had been cast in sand were taken, and similar drillings were obtained from the portion of the cast which had been taken to the casting machine, and each were carefully analyzed, with the following results:

Cast No. 7602.	Sand Cast.	Machine Cast.
Silicon	3.00 %	2.99 %
Manganese	.95	.95
Phosphorus	.770	.773
Sulphur	.041	.041
Total Carbon	3.460	3.380
Combined Carbon	.250	.920
Graphitic Carbon	3.210	2.460
Tensile Strength, lbs. per sq. in.	15,000	41,000

"The high tensile strength of the machine cast iron is due entirely to the higher percentage of its combined carbon.

"Some of the sand cast portion of this cast and some of the machine cast portion were melted separately in the same cupola, keeping all smelting conditions as nearly uniform as possible, and castings from each melt were made, which were proved by analysis, tensile strength, ability to machine and appearance of fracture to be as nearly alike as different things made from the same iron ever are. The following report on the test ingots, cast with the experimental castings, supports this statement:

	Sand Cast Pig Iron. Ingot 3½ in. square and 1½ ft. long.		Machine Cast Pig Iron. Ingot 3½ in square and 1½ ft. long.	
	Cast Horizontally	Cast Vertically.	Cast Horizontally	Cast Vertically
Silicon	2.93%	2.91%	2.96%	2.95%
Manganese	.84	.85	.84	.84
Phosphorus	.766	.769	.772	.764
Sulphur	.071	.064	.077	.071
Total Carbon	3.400	3.390	3.364	3.357
Combined Carbon	.470	.368	.336	.257
Graphitic "	2.930	3.021	3.028	3.100
Tensile Strength				
Lbs. per Sq in.	18 000	16.300	17.000	7 000
Mark on Ingot	G2-F1	G2-E1	G1-F1	G1-E

"This carefully conducted experiment proves beyond doubt that in two lots of iron, similar in chemical composition, the proportion of the total carbon present in the combined state in each lot, exercises no influence whatever on the properties of castings made from the irons after remelting.

"This experiment is quoted by the speaker in this connection merely as another method of proving the fallacy of judging the grade of a pig iron by its fracture. Here are two pigs, totally different in appearance, and yet coming from the same cast of a furnace, and proved by analysis to be practically similar in chemical composition, save in the proportion of the total carbon contained in the combined form.

"In the face of the mass of evidence which has been published in the last few years showing the variations in the chemical composition of iron of similar appearance in fracture, as well as such evidence as is given by these two pigs of entirely similar composition, but differing widely in appearance, it is hard to believe that the day is still very far distant when the present method of selling foundry pig iron by grade will be entirely abandoned.

"Let us now consider the method of grading foundry pig iron suggested by Mr. West, in which he classifies iron in 10 grades, Nos. 1 to 10, according to its silicon and sulphur but without any regard to the percentage of other constituents present. Mr. West states that he favors this method of classification as a result of his extensive experience obtained by closely following the variation in the hardness of iron castings, due to the changes in their silicon and sulphur contents. The speaker thinks that Mr. West's classification would be a marked improvement over the present method of grading pig iron by fracture, which is based only on the proportion of total carbon in the combined state, but thinks that Mr. West's method still leaves much to be desired, and that before recommending its general adoption, the American Foundry-

men's Association should consider whether or not it is possible to devise a more general method of classification, one which takes cognizance of other properties of foundry pig iron, besides the hardness imparted to the casting. A classification, in other words, which permits of calling the customer's attention to the fluidity of a certain iron, or its freedom from shrinkage, or the increased strength attending its use.

"The speaker is in doubt as to whether Mr. West's classification is to be used for grading, according to its hardness, a certain brand of pig iron, or whether he proposes to classify the different brands of foundry iron into 10 general classes. It hardly seems possible that the latter is the case, as such a classification would bring together under 'Grade No. 1,' foundry iron in different sections of this country, smelted with charcoal, coke or anthracite, and of so widely varying phosphorus and manganese contents, as to produce such differences in physical properties that they would not make castings of similar hardness even although they did contain the same silicon and sulphur, which warranted them to be classed by Mr. West as 'Grade No. 1.'

"Assuming that Mr. West has only suggested that each brand of pig iron shall be sub-divided into 10 grades according to hardness, let us consider for a moment whether the adoption of his classification would further the advancement of the application of chemistry to the foundry. Mr. West himself admits that the furnaceman in advertising the different grades of his iron, based on silicon and sulphur contents as suggested by Mr. West, should also state the percentage of phosphorus and manganese, and in some cases the total carbon, that his brand of iron contains. Mr. West also states that in order that foundry pig irons shall be shipped where they will do the work for which they are best suited, that the furnaceman should not only offer his customer a complete chemical analysis of his iron, but also a physical test based on the remelting of the pig iron in a small cupola; that his physical test should give the strength, deflection, contraction, chill and fluidity of the iron as obtained by some practical and standard system of test. If this information, in reference to the chemical and physical properties of foundry iron is to be furnished, of what advantage is it to the customer for the furnaceman to call attention to the fact that the customer will notice from the silicon and sulphur percentages reported that the iron should be classified as 'Grade No. 3' for instance?

"Mr. West further states that the phosphorus, manganese, and carbon are not touched on in his proposed classification because these ingredients are nearly constant in all brands of iron, made from similar ores, fuels and fluxes, and what slight variations in the proportion of these ingredients do exist would affect the brand very little.

"The speaker heartily wishes that the uniform conditions, assumed by Mr. West to exist, were prevalent in actual practice. The furnaceman's troubles would be greatly decreased if he always had what Mr. West calls 'similar ores' to smelt, and if he were always able to obtain 'similar fuel and fluxes' with which to smelt them.

"In other words, Mr. West's assertion that a brand of foundry iron differs little in composition, other than silicon and sulphur, would be found incorrect if the weekly shipments of a particular brand were separately and thoroughly analyzed by the customer.

"Furnacemen should be willing to advocate the adoption of Mr. West's grading of their particular brand of pig iron. It would give them a higher price for high silicon iron, requiring more fuel to produce, and would at the same time ignore the irregularities in composition other than sulphur.

"The question for the customer to decide is, can this irregularity safely be ignored? For evidence of the important influence on the properties of pig iron exercised by other elements than silicon and sulphur, attention need only be called to the program of this convention. Mr. West has presented a paper calling our attention to the influence of manganese on the properties of foundry iron, and Mr. Rossi has shown us that the strength of iron castings is materially increased by titanium.

"I am confident that those who have most closely applied chemistry to the foundry will bear him out in the assertion that no one element can safely be neglected. Should not, therefore, the American Foundrymen's Association endeavor to ascertain whether a more general classification can be devised before endorsing a classification based only on silicon and sulphur, and which at best will only be temporarily used by the trade if the customer is soon to be furnished with full chemical tests of the pig iron? And will not the adoption of such terms as 'Grade No. 1,' 'Grade No. 2,' etc., as suggested by Mr. West, cause confusion in the trade and be often interpreted as referring to the appearance of the fracture of the iron, a meaning which has for so many years been associated with the term 'Grade'? I would suggest the term 'class' instead of the term 'Grade.'

"Perhaps after deliberation the American Foundrymen's Association will decide that in view of the growing tendency to offer a complete chemical analysis of pig iron, and the desirability of supplementing this information by the physical properties of the iron when remelted, that no classification is necessary. The speaker ventures, however, to call attention in this connection to a classification of the chemical constituents of different brands of pig iron which has been found very convenient by the sales department of his company, and also by those having in charge the records of the tonnage on hand of the different brands of pig iron.

"At the works with which the speaker is connected, four kinds of pig iron are made, the surplus of each of which is disposed of in the open market: a low phosphorus pig iron, guaranteed not over .030 per cent phosphorus and .030 per cent sulphur; a Bessemer pig iron, containing below .100 per cent phosphorus and .05 per cent sulphur, and a high phosphorus pig iron below 1.00 per cent phosphorus and .05 per cent sulphur, for basic open-hearth purposes and puddle mill use. We have also more recently smelted some special foundry pig iron.

"The confusion of requirements as to the chemical composition of these widely different brands of pig iron, led the speaker to develop what he has termed 'A Decimal Classification of Specifications for Bethlehem Steel Company's Pig Irons.' This classification is first based on the manganese contained in the iron. The table is divided vertically into three manganese divisions—first, a manganese of .75 per cent or under; second, a manganese of .76 per cent—1.50 per cent; and third, a manganese of 1.51—2.25 per cent. Each of these three manganese ranges is sub-divided vertically into ranges of silicon, as follows: .01 per cent—.75 per cent; .76 per cent —1.00 per cent; 1.01 per cent—1.25 per cent; 1.26 per cent—1.75 per cent; 1.76 per cent—2.25 per cent; 2.26 per cent—3.25 per cent, etc. The table is then sub-divided horizontally according to limits of phosphorus and sulphur, allowing in each of the three kinds of iron—low phosphorus, Bessemer, and high phosphorus—for the variations in phosphorus and sulphur unavoidable owing to the differences in the raw materials used.

"By this arrangement, four elements are allowed for—manganese, silicon, phosphorus and sulphur. It would seem that this same system might be applied to the classification of foundry pig irons, and that if desired the total carbon, as well as manganese, silicon, phosphorus and sulphur, could be allowed for.

"In order to make any standard method of grading pig iron by analysis of practical application, it should be accompanied by a recommendation as to a standard method of sampling a cast of pig iron, and ranges in composition for the different grades or classes suggested should not be so narrow as to allow for the unavoidable variations in composition of the different parts of a cast of pig iron.

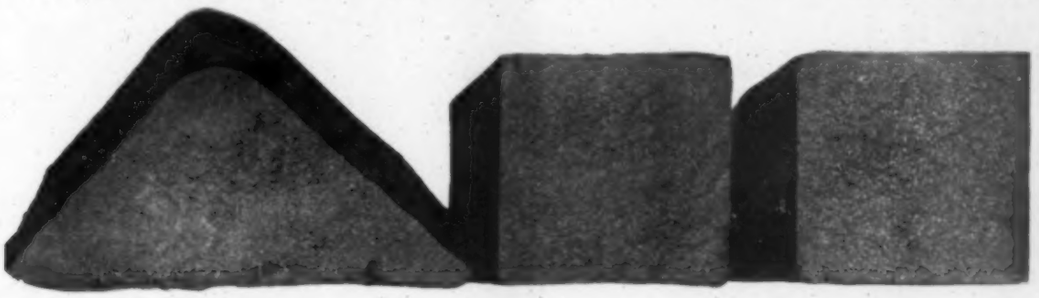
"I need not lengthen this discussion by quoting from the literature of this subject, for it is well known to you that much evidence has been presented during the last five years showing the variation, for instance, in silicon and sulphur between the different pigs in a cast of iron, and in fact between the different portions of the same pig.

"I do not mean for a moment to deny the right of the buyer's chemist to ascertain whether the furnaceman has shipped iron within a certain guarantee in chemical composition, but I do claim in the face of the well-known variations in composition existing, that each carload of iron should be taken as a unit, and that the buyer's analysis should be made

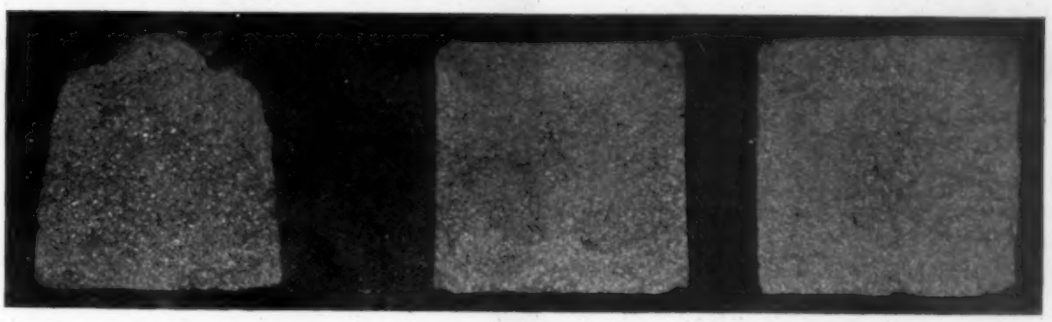
from drillings from at least a dozen pigs from each car, said drillings to be taken as nearly as possible to represent the entire face of the pig, before he can justly claim that the carload of iron shipped falls outside the guarantee.

"The furnaceman is in a better position to determine the average composition of his cast of iron than the buyer, no matter how thoroughly the buyer may sample the cast. The furnaceman's sample should consist of small ladlefuls taken from the runner at least four times during the casting, and each ladleful poured into a small ingot, or shotted, by pouring slowly onto a coarse wire gauze resting on a bucket of cold water. If small ingots are used, equal quantities of drillings from each ladle should be taken. If the shotted sample is taken the shot selected should be entirely passed through an 80-mesh sieve.

"In closing this discussion, I would recommend that the thanks of the American Foundrymen's Association be given to Mr. West for having taken the initiative in bringing this important matter before this convention. I am heartily in favor of grading or rather classifying foundry pig iron by analysis, and of doing away entirely with the present method of grading by fracture. I have taken the liberty of suggesting how Mr. West might have submitted more striking proof of



MACHINE CAST PIG IRON. CAST HORIZONTALLY. CAST VERTICALLY.



SAND CAST PIG. CAST HORIZONTALLY. CAST VERTICALLY.

iron and the castings made therefrom and photographs of the fracture.

"In adopting a classification for foundry pig irons, other elements than silicon and sulphur should be considered, and too narrow a range in classifying the different grades should be avoided, on account of the variations in the chemical composition of a cast. Finally I suggest that in recommending a method of classifying foundry pig irons by chemical analysis, the American Foundrymen's Association should also recommend a standard method of sampling foundry pig iron, both at the furnace and after loading on cars."

Photographs showing the fracture of both the sand cast and machine cast pigs referred to in the paper were shown by Mr. Colby and samples of both were passed among those present. We reproduce the photographs herewith.

J. G. Sadlier continued the discussion by suggesting that the classification of iron be not only determined by chemical analysis, but by fracture as well. He contended that some chemical analyses show that one result the irregularity of composition of various No. 1 foundry irons, and have quoted an experiment recently made at the works of the Bethlehem Steel Co. as proof of the wide difference in appearance of a fracture which may be exhibited by iron of the same composition. Herewith are specimens from this cast of

should be obtained in many instances while just the reverse is the result in practice. At this juncture Mr. Colby said that very often the chemist is at fault and without a doubt he said that as a result of poor chemists much feeling has been engendered against the method proposed. He added that where one good chemist is found there are ten that are not up in their profession. Mr. Sadlier then stated that it would not always be possible to secure from the furnacemen just what was wanted in the specifications presented, but Dr. R. G. Moldenke said that he has never purchased iron except by chemical analysis and has insisted on the chemical contents conforming to the specifications and was always able to secure from the furnacemen just what was wanted. A vote of thanks was extended Mr. Colby for the preparation of this paper and the Bethlehem Steel Co. was also included for the interest taken in the matter. By motion the chair authorized Mr. West to appoint a committee to act with him for further investigation of this question and the chairman requested Mr. Colby and Dr. Moldenke to act with him, with instructions to report at the next annual convention.

Discussion by Thomas D. West.

As a member, independent of my committee, I wish to comment on the views that are expressed in the memorial presented to this convention on grading pig iron by analysis. While more than two-thirds of those answering the circular have endorsed my method of grading, I am open to accept any other plan that may prove more advisable. I am well aware that my method is open to criticism on the ground of too close grading. However, I believe that a few have misunderstood the full import of my proposition.

It was not my idea that because the grades were divided at every quarter of one per cent in silicon, and in sulphur ranged from .01 to .10 per cent, as shown by the table, that any furnaceman should be compelled to fill orders from any one grade of iron. It is intended that the number ordered would indicate the grade of iron the consumer desired, and to fill the order the furnaceman could ship any number of grades from which an average could be obtained which corresponds to the grade ordered.

Our foundry is surrounded by blast furnaces and we require probably as close grading in making our mixtures as any other manufacturer, yet we never think of confining a furnaceman within the full 1 per cent of silicon or 0.03 per cent of sulphur in the iron he furnishes us. If, for example, in following the method of grading I advanced, we desire a No. 4 iron, which has 2. to 2.25 silicon and .01 to .05 sulphur,

we can accept iron ranging from No. 1 to No. 8, to make an average which will give the grade No. 4 desired, provided we know the grade of every car. There is surely sufficient margin in this method to permit the furnaceman to fill an order for any particular grade of iron, so far as we are concerned.

There may be furnacemen or salesmen present with whom our firm deals. If there are, they know that we consume at every heat from 60 to 90 tons of pig iron, which should not vary 15 points in silicon or be above .05 in sulphur in our castings. While we obtain such very fine grading in our castings day after day, we never think of confining a furnaceman to shipping the exact grade we desire in our castings. It is not unusual for a furnace to make a special run and stock iron for our needs, and in doing this they may often have many different grades stocked up for our use, but keep in mind the grade of iron we require in our castings and average shipments in such a manner that every pound of iron is used.

When foundrymen as a rule produce castings that are to be of some particular softness or hardness, and we know that a change of 25 points silicon and 2 points sulphur can cause them to vary from the best grade in their castings, I fail to perceive the impracticability of any furnaceman accepting orders by the method of numbering the grades from 1 to 10, which I have advanced. In fact, any greater margin would fail to denote the true character of the iron desired and could cause such misunderstanding as to result seriously for both furnaceman and founder.

What is required is a method of numbering that will denote when the character of iron is noticeably changed and not something that is so flexible that any change from one number to another would make a mixture varying so greatly as to give castings that should be condemned. This some of the methods advanced would do.

One objection made to my method of grading is that errors in analyses could make a difference of .25 per cent silicon and .01 in sulphur. Granting this true, as is often the case, and which is a good point to bring up, does this offer any good reason for the consumer not defining as closely as he may the grade he desires, to correspond with any range in numbers from 1 to 10, in the method I have presented? If such differences in analysis continue to exist, they can injure the consumer as much as if grades were divided by one per cent of silicon, instead of by .25 per cent. To my view, this is a factor that should have no weight in deciding the division of grades. However, by the use of the association's standardized drillings and the adoption of more uniform methods to make analyses, which is sure to come, there will be little excuse for any great difference in the chemical analyses of one sample of drillings by different chemists.

Mr. Marshall, in commenting on my methods, believes they are too close, and suggests another which presents a sliding scale, and in which he would confine the furnaceman to limits of graphitic and total carbon. It is practical to obtain certain percentages of silicon and sulphur, but to confine them to limits of graphitic and total carbon, along with silicon and sulphur limits, is something which I do not believe would meet the endorsement of furnacemen generally. It must be borne in mind that whatever we do should be the best to meet general conditions. My plan confines the grading to percentages of silicon and sulphur only, and wherever anything special is desired in the percentages of the carbons, manganese or phosphorus, let this be designated independent of the silicon and sulphur, which are the variable elements in any iron produced from the same ores, fuel and flux, and which alters the true grade of all cast pig metal.

Some have objected to my method of confining sulphur to .02 in the No. 1 grade shown in my table. Any founder who really requires a No. 1 iron, having silicon 3. per cent, should not have sulphur exceed the limit I gave. If the sulphur does exceed this, then higher silicon will be necessary, or else the iron will be harder in the castings than what would be obtained by using the No. 1 grade as shown in my table.

The constitution as revised by the committee consisting of Willis Brown, W. A. Jones, C. S. Bell, W. J. Keep and Dr. R. G. Moldenke was adopted with only a few minor changes. The new constitution provides for an annual meeting of the Association in May instead of June and the place of holding the next convention if not determined upon in convention can be fixed by the executive board. In addition the outgoing president presides throughout the entire convention instead of relinquishing the chair to his successor as soon as he is elected.

THURSDAY MORNING.

On Thursday morning the paper prepared by C. Vickers of Chicago, on "The Melting of Brass," was read by title in the absence of the author. F. Conlon of South Bethlehem, Pa., then read a paper on "The Insurance of Patterns," which will be published later.

S. Groves of Pittsburg followed with a paper on "The Engineer in the Foundry," which was illustrated fully by large colored drawings and proved of much interest. The following papers were read by title in the absence of the writers: "Foundry Costs," by R. C. Cunningham, of Holyoke, Mass.; "Foundry Mixtures," by Jas. A. Murphy, of Elizabeth, N. J.; "The Relation of the Laboratory to the Foundry," by Percy Longmuir of Sheffield, Eng.; "The Tropenas Converter Steel Process," by A. Tropenas of Paris.

A vote of thanks was then extended all those who prepared papers for the meeting. Dr. R. G. Moldenke was authorized to represent the American Foundrymen's Association at the meeting of the International Testing Society to be held at Buda-Pesth, Austria-Hungary, in September, and while on his tour abroad to represent the Association wherever he might go.

The question of technical schools was brought up by Mr. West, who moved for the appointment of a committee of three to look into the matter and report at the next meeting. Some discussion was precipitated. T. J. Best of Montreal, Can., opened it by relating the experience of Warden King & Son of Montreal in the organization of a school for the men in their employ. He said that his firm spent $500 in fitting up a schoolroom for the apprentices and secured the foremen in each department to give them evening instruction. The boys were to attend three nights a week, but from the start Mr. Best said that it was a failure. Not one of them could be coaxed into attending the sessions and after a considerable expenditure of money the school was abandoned. He said further that it was an extremely difficult matter to make the boys see the advantages of such schools.

S. Groves of Pittsburg told of what the Westinghouse interests are doing in this direction, meeting with great success in their departure. Mr. Groves suggested that all foundrymen should organize classes for the apprentices in their shops. Mr. Sadlier endorsed Mr. Groves' remarks. He said the foundryman should make his foundry the college for the training of apprentices, molders and foremen. Willis Brown of Erie, Pa., on the other hand, said that he believed that the technical schools of the country will offer everything that is practical in this direction as soon as the requirements of the foundrymen are learned.

J. S. Seaman of Pittsburg, Pa., suggested that the committee as suggested by Mr. West was scarcely needed, for the reason that this matter is under advisement by the trustees of the fund donated by Andrew Carnegie for the founding of a technical school in Pittsburg. Mr. Seaman said that the interests of the association would be looked after by the committee of the Pittsburg Foundrymen's Association, all members of this association who have been appointed to look after the interests of the foundrymen in the establishment of the new school. It was deemed best, in view of this statement, to take no further action.

At this juncture a telegram was received from the Philadelphia Foundrymen's Association extending their best wishes for the success of the convention. The following reply was made: "To the Philadelphia Foundrymen's Association, Philadelphia, Pa.: Thanks for congratulations. We are having a large and enthusiastic convention. Philadelphia foundrymen conspicuous by their absence. Why should this continue when A. F. A. was inspired by you and organized in your city? A. F. A."

Officers for the Coming Year.

The nominating committee then reported. By request of Howard Evans, treasurer of the association since its organi-

zation, his name was not reported to the convention for the treasurership. The list of recommended officers follows:

President—J. G. Sadlier, Springfield Foundry Co., Springfield, O.

Vice-presidents: First district, New England States, Theo. H. Colvin, Colvin Foundry & Machine Co., Providence, R. I.; second district, comprising New York and New Jersey, Walter F. Prince, H. R. Worthington Co., Elizabeth, N. J.; third district, comprising Delaware, Maryland and District of Columbia, S. D. Sleeth, Westinghouse Air Brake Co., Pittsburg; fourth district, comprising Michigan, Ohio, Kentucky and Tennessee, C. A. Bauer, of Warder, Bushnell & Glessner Co., Springfield, O.; fifth district, comprising Indiana, Illinois, Kansas, Colorado, New Mexico, Utah, Arizona, Nevada and California, E. W. Smith, Crane Co., Chicago; sixth district, comprising Wisconsin, Minnesota, Iowa, North Dakota, South Dakota, Idaho, Nebraska, Montana, Wyoming, Washington and Oregon, E. B. Gilmour of E. P. Allis Co., Milwaukee, Wis.; seventh district, comprising Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma and Texas, J. P. Golden, Golden Foundry & Machine Co., Columbus, Ga.; eighth district, comprising Provinces of Ontario and Quebec in the Dominion of Canada, T. J. Best, Warden King & Son, Montreal.

Secretary—Dr. R. G. Moldenke, New York.

Treasurer—Thomas D. West, Sharpsville, Pa.

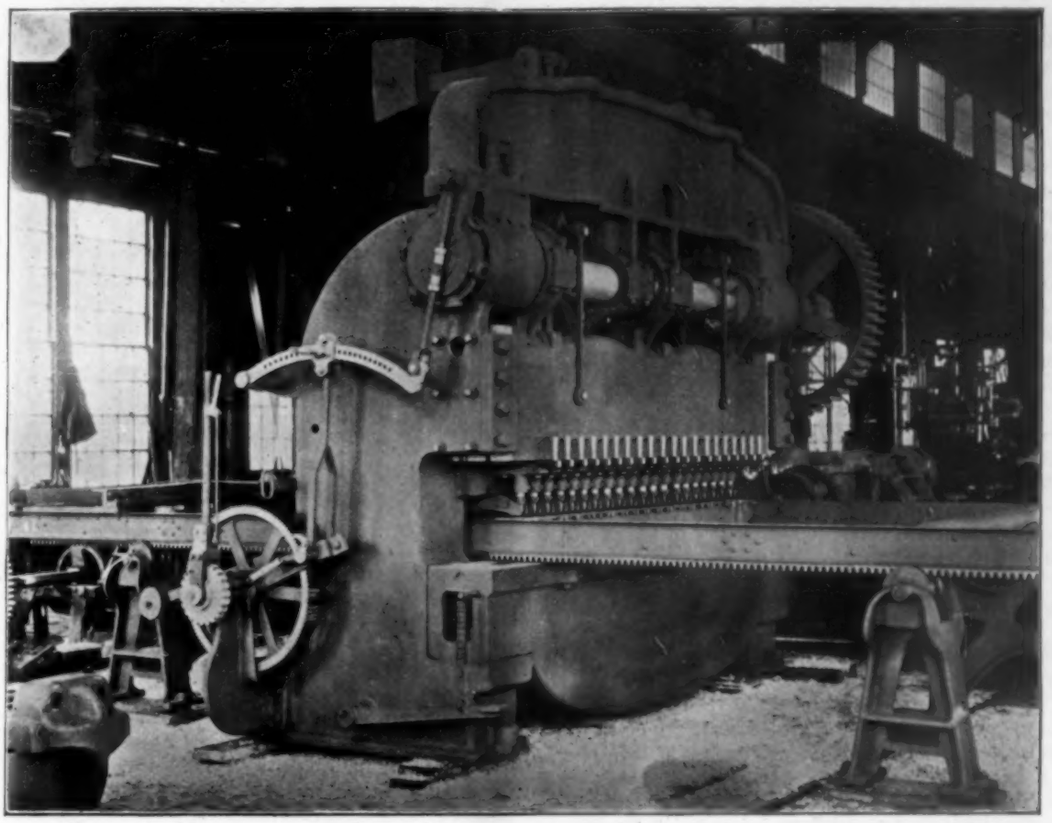
On motion the secretary was requested to cast the vote of the convention and the above officers were declared elected. The newly elected president, Mr. Sadlier, was then escorted to the rostrum and thanked the members for the honor conferred. The outgoing president, Mr. W. A. Jones, was elected an honorary member. C. S. Bell then proposed the following resolution, which was adopted: "Resolved, that the hearty thanks of this association be and is hereby extended to the local committee of the Buffalo foundrymen for their very complete preparations for our entertainment and especially would we thank Mr. O. P. Letchworth for his unfailing attention."

Suggestions were then called for by the chair for the next place of meeting. Both Chattanooga, Tenn., and Birmingham, Ala., have asked for the next convention, but in the absence of a special request no action was taken by the association and the matter was left in the hands of the executive committee as provided in the constitution. A vote of thanks was then extended to the retiring president for the able manner in which he had conducted the office and after an appropriate response the convention was declared adjourned.

There was no meeting of the Plumbago Club owing to some misunderstanding in the arrangements for this annual event. Many of the visitors returned home on Thursday evening. A few remained over, however, to continue their inspection of the Pan-American Exposition.

MULTIPLE PUNCHING MACHINE.

The accompanying illustration shows a multiple punching machine which has been installed at the plant of the American Steel Foundry Co., of St. Louis, by Williams, White & Co., Moline, Ill. This machine is used in the manufacture of steel cars, and is equipped with an automatic spacing table, 80 feet long. Each punch is controlled by its own gag, which may be operated as desired. When the gag is drawn out the punch does not operate. The machine weighs about 80,000 lbs., and takes a plate 8 feet wide between the housings, and 40 feet long.



MULTIPLE PUNCHING MACHINE.

The Texas oil boom continues beneficial to the local steel manufacturers. In addition to the large tonnage already placed with local manufacturers the Riter-Conley Mfg. Co. has received an order for 10 tanks with a capacity of 75,000 gallons each from one of the large oil companies, the Pressed Steel Car Co. has received an order for 100 steel cars with tanks and the National Tube Co. has received an order for 26 miles of 10-inch pipe. The contracts for 10 oil barges and machinery for 15 wells were also placed with the Riter-Conley Manufacturing Co. The J. M. Guffey Petroleum Co. of Texas has sent specifications to the Riter-Conley Manufacturing Co. for the erection of stills with a daily capacity of 10,000 barrels.

The strike at the furnaces of the Buffalo Union Furnace Co., Buffalo, has been declared off. The result is a compro-

PERSONAL.

W. R. Palmer, for a number of years connected with the Cleveland Rolling Mill Co., Cleveland, will retire on July 1 from the superintendency of the Tennessee Coal, Iron & Railroad Co.'s steel plant at Ensley, Ala., being succeeded by John McConnell, formerly of Coatesville, Pa., who is now his assistant.

James Beldin has been appointed assistant to Chairman D. H. Bacon, of the Tennessee Coal, Iron & Railroad Co. General Manager McCormick will devote special attention hereafter to the coal interests of the company. Edwin Ball, formerly associated with Mr. Bacon in the Minnesota Iron Co., will have charge of the iron ore properties.

Archer Brown, of New York, resident partner of Rogers, Brown & Co., sails for Europe with his family on June 19.

Dr. Richard Moldenke, of New York, secretary of the American Foundrymen's Association, will attend the congress of the International Association for Testing Materials, at Buda-Pesth, in September.

Arthur F. Luke, treasurer of the United States Steel Corporation, has been elected a director of the Liberty National Bank, New York.

It is reported that Henry Wick resigned as president of the National Steel Co. at a meeting of directors held on Monday, June 10.

A number of changes in official positions at Youngstown, O., plants became effective last week. L. A. Treat was made master mechanic at the Ohio steel plant of the National Steel Co., succeeding W. Edwards. L. A. Woodard assumed the duties of electrical engineer at the plant of the William Tod Co., succeeding Mark C. Steese, who has accepted a position in the Pittsburg office of the Wheeling Mold & Foundry Co. Walter Durbin, superintendent of the pipe fitters at the Bessemer plant of the National Steel Co., became superintendent of the same department with the Youngstown Iron Sheet & Tube Co.

Andrew Carnegie signed a deed last week transferring $10,000,000 in 5 per cent United States Steel Corporation bonds to trustees for the benefit of universities of Scotland.

Dr. John Alexander Matthews, of Columbia University, holder of the Barnard scientific fellowship, and designated by the Iron and Steel Institute to receive one of the research fellowships recently founded by Andrew Carnegie, has been granted permission to pursue his studies under Prof. Henry M. Howe, of the department of metallurgy, at Columbia.

Noah B. Howe has been appointed superintendent of the Woodstock furnaces at Anniston, Ala., which will be blown in about July 1.

F. E. House, general manager of the Bessemer & Lake Erie Railroad Co., lessee of the Pittsburg, Bessemer & Lake Erie railroad, was last week elected president of the Duluth & Iron Range Railroad, which includes all of the Lake Superior lines of the United States Steel Corporation. He will be succeeded by E. H. Utley, of the Bessemer line. Mr. House succeeds J. L. Greatsinger, who lately became president of the Brooklyn Rapid Transit. Before he became affiliated with the Bessemer road, Mr. House was connected with the Pittsburg & Lake Erie. He is a graduate of the Rensselaer Polytechnic Institute of Troy, N. Y. His assistant will be J. S. Mattison.

William E. Corey, president of the Carnegie Co., was the guest of honor at a dinner given at the Hotel Schenley, Pittsburg, Saturday evening, June 8, by the department superintendents' club of the Homestead Steel Works. The guests and members of the club present were W. E. Corey, Thomas Morrison, James Scott, L. T. Brown, A. C. Dinkey, J. E. Schwab, A. R. Hunt, E. F. Wood, H. J. Davis, Peter Weber, J. L. Harvey, J. H. Grose, H. D. Williams, P. T. Berg, G. K. Hamfeldt, J. W. McGrady, D. S. Kennedy, William Whigham, S. S. Wales, C. Orchard, J. C. Lawler, J. S. Unger, J. M. Molamphy, C. E. McKillips, G. W. G. Brownall, and J. H. Slocum.

Charles Dinkey was appointed superintendent of the Edgar Thomson Steel Works of the Carnegie Steel Co. at Braddock, Pa., this week, to succeed Thomas Morrison, who left for a six months' tour of Europe, during which time he will visit his uncle, Andrew Carnegie. Mr. Dinkey was formerly superintendent of the foundry and is a brother of Superintendent A. C. Dinkey, of the Homestead plant. George England, foreman of the foundry, will succeed Mr. Dinkey as foundry superintendent. Frank Power will be his assistant.

Samuel Benner, representative of the Carnegie Steel Co. in Mexico and South America, with headquarters in the City of Mexico, returned to Pittsburg this week. Mr. Benner has just completed a very successful trip through South America, and will shortly return.

Glenn C. Brown, manager of the Fayal Iron Co. at Eveleth, Minn., has tendered his resignation to become effective on July 1. He will be succeeded by R. R. Trezona. It is probable that Mr. Brown will accept a position with the Tennessee Coal, Iron & Railroad Co.

Lake Superior Iron Mines.

At Champion, Mich., one of the most important discoveries of ore on the Marquette range for some years has just been made, near the old Parsons mine, the place of the original discovery of the Champion mine. The ore is magnetic and of high grade, running a trifle over 70 per cent iron, and similar to even better ore produced by the old mine. The vein outcrops within six feet of the surface. A shaft will be sunk in the ore immediately. Indications point to a big deposit. The Champion is the deepest iron mine in the United States, the No. 5 shaft having reached a depth of 1,900 feet. The mine company intends to explore all its lands, comprising 15,000 acres. The North mine of the company is showing up well.

The Federal mine on the Menominee range, formerly known as the Gladstone, which was secured by the Cundy mine under lease, is being rapidly developed. The St. Paul road has let the contract for a spur track, four miles long from the Quinnesec branch.

The Oliver Iron Mining Co. has surrendered the option under which it has been exploring the Lucy and Pendill mines on the Marquette range for the past few weeks.

Operations at the old Saginaw mine, about three miles southwest of Ishpeming, Mich., have resulted in bottoming three test pits in high grade Bessemer ore. It is believed there is a large deposit. The ore recently found is a hematite; that in the old Saginaw was hard ore.

Obituary.

Charles H. Ashburner, for many years president of the Abbott Iron Co., died at his home in Baltimore, Md., on Wednesday, May 22. Deceased entered the employ of the Ashland Iron Co. of Baltimore, about 1850, remaining nine years. He was afterwards a member of the firm of Charles H. Ashburner & Co. and Brooke Bros. & Co., iron merchants. During the war he accepted a position with H. Abbott & Son, afterward incorporated as the Abbott Iron Co., and was in turn superintendent, vice-president and president until 1885, when the company retired from business. He then went to Pottstown, Pa., as treasurer of the Pottstown Iron Co., remaining there until his return to Baltimore about three years ago.

Edward Kerns, superintendent of the Youngstown Steel Roofing Co., was knocked from a flat car last week while supervising the unloading of some material and was almost immediately killed. He was formerly superintendent of the Falcon mills at Niles, O., and for a time was connected with the American Sheet Steel Co. in a similar capacity.

A remarkably perfect steel casting was recently shipped from the works of the Seaboard Steel Casting Co. of Chester, Pa. The casting of propeller wheels in one piece is always difficult, and it is seldom that an attempt is made to mold one so large as that here referred to. This wheel, which is for a repair job on the Old Dominion steamship Jefferson, was shipped to the W. & A. Fletcher Co., at Hoboken, N. J. It is 17 feet in diameter and weighs a trifle under 19,000 pounds, and is smooth and perfect. The work of molding, drying, casting, and finishing the propeller was completed in two weeks. The wheel was shipped on a Pennsylvania Railroad coal car, the hopper of which was removed so that one blade could project through the bottom of the car. In this way it cleared the bridges and tunnels.

AMERICAN SECTION OF THE TESTING ASSOCIATION.

The fourth annual meeting of the American Section of the International Association for Testing Materials will be held at Niagara Falls, N. Y., on June 29, 1901, the day after the close of the convention of the American Society of Civil Engineers. The headquarters will be at the International Hotel. There will be three sessions, and the preliminary program of proceedings includes the following:

Report of the executive committee regarding the Congress at Buda-Pesth, in September, 1901.

Discussion of the specifications recommended by the American Branch of Committee No. 1 for structural steel for buildings, structural steel for bridges and ships, and open-hearth boiler plate and rivet steel.

Discussion of the specifications recommended by the American Branch of Committee No. 1 for steel rails and steel splice bars.

Discussion of the specifications recommended by the American Branch of Committee No. 1 for steel axles, steel tires and steel forgings.

Discussion of the specifications recommended by the American Branch of Committee No. 1 for steel castings and wrought iron.

Reports of other technical committees on iron and steel.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of their Wants: —

The Garden City Spring Works, of Chicago, to manufacture springs for vehicles, has been incorporated with a capital of $8,000 by W. Hardy, Oliver T. Cody and Walter K. McIntosh.

The Brass Goods Manufacturing Co., of Brooklyn, N. Y., has increased its capital stock from $20,000 to $40,000.

Promoters are projecting the erection of a $1,000,000 steel plant at Conshohocken, Pa.

The Higley Machine Co., of Croton Falls, N. Y., has been incorporated with a capital of $25,000 by George Juengst, Jr., Charles A. Juengst and L. B. Conkling.

The Sebastian Clark Machinery Co. of St. Louis, Mo., has been incorporated with a capital of $12,000. Hiram H. Clark, Charles Sebastian and F. T. Clark are the incorporators. The new company will manufacture and deal in tools, machinery and iron and steel implements.

The plant of the Cornell Machine Co. of Chicago, Ill., will in all probability be removed to Quincy, Ill., where the citizens have raised $75,000 for the enlargement of the company's business. The new concern will be known as the Quincy Steel & Iron Co., and will carry on the business of the Cornell Machine Co., on a more extensive scale. The company manufactures engines and heavy forgings.

Lane Lyle, formerly with the Chattanooga, Tenn., Machinery Co., will shortly incorporate a company for the operation of a large machine shop at Chattanooga.

The Bridgewater Steel Co. of New York, with a capital of $650,000, to manufacture bar and sheet steel, was incorporated in New Jersey last week. J. V. Batton, R. McKee and W. Avery are the incorporators.

The Youngstown Brass & Iron Foundry Co., of Youngstown, O., has been organized with a capital of $15,000. The incorporators are J. W. Morrison, Jr., Robert D. Gibson, Robert Kelly and John W. Morrison, Sr. Robert D. Gibson has been elected president; John W. Morrison, Jr., vice president and general manager, and Robert Kelly, secretary. The company has purchased the Morrison foundry at Youngstown, and will engage in the casting of brass and bronze for rolling mill and tin mill purposes especially.

The Ingram & Richardson Manufacturing Co. has been organized at Beaver Falls, Pa., for the purpose of manufacturing enameled ware. The plant of the Midley belt company at Beaver Falls has been leased and work will be commenced immediately. Louis Ingram is president; E. Richardson, secretary; E. L. Hutchinson, treasurer.

The controlling interest in the Helmbacher Forge & Rolling Mill Co. at St. Louis, Mo., has been sold to men connected with the American Car & Foundry Co. James Green, president, and several minor stockholders retire. Officers have been elected as follows: W. J. McBride, president; L. C. Leonard, manager of the Detroit plant of the American Car & Foundry Co., vice president; D. A. Bixby, secretary; S. S. Delano, treasurer.

The Cuyahoga Steel & Wire Co. has been granted a New Jersey charter with a capital of $500,000. The incorporators are C. V. Childs, J. R. Mapletoft and H. Smith.

The Atlantic Machine & Iron Works, located at 1211 Arctic avenue, Philadelphia, Pa., have been sold to W. S. Ashby, of Philadelphia, Pa. Extensive additions and improvements are to be made to the plant.

The Ollard Machine Works and the Tacoma Brass and Machine Works, of Tacoma, Washington, have decided to erect a foundry jointly, for making iron and brass castings. The two plants have had some trouble in the past in securing castings and have decided to erect their own foundry.

The capital stock of the Advance Machine Co., of Chicago, has been increased from $2,500 to $50,000.

The Watson Machine Co. is erecting a plant at Paterson, N. J., for the manufacture of machinery to be used in the flax industry. At the present time all this machinery is imported from England.

The Ashland Sheet Mill Co., of Ashland, Ky., has been incorporated with a capital of $250,000. A. J. McCullough, of Zanesville, O.; F. A. McCullough, of Dresden, O., and I. A. Kelly, of Ashland, are the incorporators.

The Simmons Pipe Bending Co., of Newark, N. J., was incorporated this week with a capital of $25,000. The company will engage in the bending of all kinds of pipe and fittings. The incorporators are Charles H., John S. and Frank H. Simmons, H. L. Moody and Frederick S. Walker.

The Marble-Swift Manufacturing Co., of Chicago, Ill., has been incorporated with a capital of $100,000 for the manufacture of tools, implements and machinery. George W. Marble, George P. Swift and H. I. Keck are the incorporators.

The Ellington Manufacturing Co., of Quincy, Ill., has been incorporated with a capital of $150,000 to manufacture machinery and machine tools. George Wells, Herman Heidbreder and W. T. Dwire are the incorporators.

Fires and Accidents:—

The Kerrihard Co.'s foundry at Red Oak, Ia., was destroyed by fire last week entailing a loss of $2,000.

The plant of the Birmingham Foundry & Supply Co. at Avondale, Ala., was burned last week, with a loss of $10,000.

At Menasha, Wis., the works of the Menasha Wood Split Pulley Co. burned to the ground June 9. Loss, $50,000; insurance, $20,000.

The large foundry and enameling plant of the Humphrey Mfg. Co. at Mansfield, O., was destroyed by fire last week; loss, $75,000.

New Construction:—

It is unofficially announced that the American Tin Plate Co. will increase the capacity of its plant at Joliet, Ill. The present plant, it is reported, is to be increased from four to 16 mills.

Kitselman Bros., manufacturers of woven wire fencing, whose plant is located at Muncie, Ind., have decided to erect their own wire plant. A site of 11 acres has been purchased upon which is located the abandoned plant of the Patton Hollow Ware Co. A number of buildings now standing will be utilized by the new wire plant, but other buildings are to be added. The equipment will represent an expenditure of nearly $150,00.

The Knoxville Iron Co. of Knoxville, Tenn., has purchased a site of 25 acres at Knoxville, upon which it will locate a large rolling mill with a capacity of several hundred thousand tons of iron annually. The present plant is to be abandoned as soon as the new one is erected. The plans of the new company have not been definitely decided upon, but it is probable that a steel plant will be added.

The new foundry to be erected by Wm. Tod & Co. at Youngstown, O., is to be one of the most modern and best equipped plants in the country. It will be 250 feet long, 86

feet wide with a 40-foot lean-to extending the entire length of the building. It will be 42 feet high and will be equipped with three 30-ton and two 5-ton electric traveling cranes, with an 80-foot span. The lean-to will be 38 feet high equipped with one 5-ton electric traveling crane. The American Bridge Co. has the contract for the structural steel and erection while the cranes will be furnished by the Morgan Engineering Co. of Alliance, O., and the Northern Engineering Works of Detroit, Mich.

The American Iron & Steel Manufacturing Co. of Lebanon, Pa., is now engaged in making extensive improvements. A new galvanizing plant is to be built, and pumping station, water tower, keg factory and an additional machine shop.

The Standard Gauge Steel Co. of Beaver Falls, Pa., has under consideration an addition to its plant 100 feet long and 100 feet wide.

The completed portion of the new plant of the Browning Engineering Co. at Collinwood, O., is being operated to its full capacity. A department of the works that will be extended is that of steel construction. It is in charge of E. J. Neville, who recently resigned the general superintendency of the Garry Iron & Steel Co.

The first of the 18 or 20 buildings the Lake Shore Railroad will erect for repair shops at Collinwood, O., is under way and about $2,000,000 will be expended before present plans are completed. There are also at Collinwood the works of the Browning Engineering Co., which will not be complete for another year, and are then expected to employ upwards of 700 men. The Kuhlman Car Co. is a third Collinwood enterprise. A plant for building electric cars will be erected at once, employing several hundred men. The Bronson-Walton Co. has also secured a Collinwood site and will manufacture hardware specialties.

The Garrett-Cromwell Engineering Co., of Cleveland, has let the contract to the Riter-Conley Mfg. Co. for the iron work for the St. Clair Furnace Co.'s three stacks to be erected in the Pittsburg district. The seven blowing engines will be furnished by the Southwark Foundry & Machine Co., of Philadelphia. They will have 48-inch high pressure and 84-inch low pressure cylinders, 84-inch blowing tubes and 60-inch stroke.

The Kokomo Steel & Wire Co., of Kokomo, Ind., which expects to build a wire and nail plant near St. Louis, has let the contract for its rod mill to the Garrett-Cromwell Engineering Co., of Cleveland. MacKintosh-Hemphill Co., of Pittsburg, will furnish the engine, which will be tandem compound of 3,000 h. p.

New Buyers.

The Youngstown (O.) Brass & Iron Co. has been incorporated with a capital stock of $15,000. The directors are J. W. Morrison, Jr., R. D. Gibson, Robert Kelly, L. Gibson, and J. W. Morrison, Sr. The officers elected are: President, R. D. Gibson; vice president and general manager, J. W. Morrison, Jr.; secretary and treasurer, Robert Kelly, Jr.

John T. Jones has leased from the Antoine Ore Co., of Iron Mountain, Mich., a building which he is fitting up as a machine shop.

The Buckeye Engine Co. of Salem, O., will erect a five-story building for carpenter shop and pattern room, storing department, draughting room and the offices of the company.

Ground was broken last week at Girard, O., for the plant of the Girard Foundry & Machine Co. Two tile buildings, 30x50 and 50x60 feet, will be built.

Eckel Brothers' Steel Co. of Syracuse, N. Y., will commence the erection of a new heating furnace on July 1. An additional machine shop will also be built.

Good progress is being made with the erection of the foundry at the plant of the Union Iron Works, at Decatur, Ill. It is a brick structure 80x50 feet in size and when completed the old foundry will be abandoned.

General Industrial Notes:—

Chattanooga Furnace at Chattanooga, Tenn., has been put in blast.

The output of the plant of the American Steel Hoop Co. at Mingo Junction, O., for the month of May amounted to 5,700 tons, which broke all previous records for this plant. The next best record was made two years ago when the output reached 5,420 tons. The present tonnage means a daily output of more than 200 tons.

Furnace No. 1 at Middlesboro, Ky., operated by the Virginia Iron, Coal & Coke Co., resumed operations last week after an idleness of nearly a year.

Charles H. Besly & Co., 10 and 12 N. Canal St., Chicago, report their general business very good. They have recently made shipments of complete shop equipments to points in Illinois, Indiana, Ohio, Wisconsin and Minnesota. They have received an order from the Rock Island Arsenal for several hundred vises, cutters, reamers, and other small tools. They are extremely busy in their tap and die department at Beloit, Wis., and are obliged to work overtime in order to fill orders, there being an unusual demand for their new Helmet temper taps. They have never sold as many Gardner grinders as at the present time, and shipments are being made almost daily to all parts of the world. The company's new 300-page illustrated catalogue is ready for distribution, and will be mailed free upon application.

Sixty Chicago and Milwaukee customers of the Kewanee Boiler Co. of Kewanee, Ill., were entertained last week at the new plant of the company.

George C. Johns, dealer in engines and boilers, New York, N. Y., last week filed a petition in bankruptcy with liabilities of $42,000 and no assets.

All the employes of the Youngstown, O., plant of the National Tube Co. to the number of 400 have been granted advances in wages averaging about 8 per cent. The Republic Iron & Steel Co. has also made a voluntary advance in the wages of the laborers employed in the Brown Bonnell plant at Youngstown, O., amounting to 10 cents a day.

The grading for the new plant of the Youngstown Engineering Co. at Haselton, O., has been completed and the switch from the main line is being laid to the site of the new plant.

The foundrymen of Youngstown, O., have not yet granted the molders a shorter day. They have offered to meet the men half way, granting them a concession of half an hour instead of an hour. The men have rejected this offer, however.

William Fleming's Sons of New Castle, Pa., have been granted the contract for the erection of six steel stacks to be erected at the New Castle plants of the National Steel Co. Each of the stacks will be seven feet in diameter and 150 feet high.

Owing to its inability to secure quick delivery on sheets the New Process Galvanizing Co. of Niles, O., has been compelled to import sheets from England. The new plant has considerable demand for its new product.

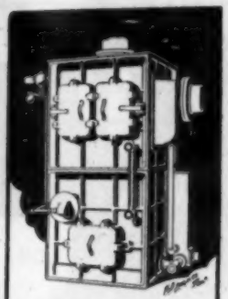
The Columbus Iron & Steel Co. of Columbus, O., will install a McMyler slag and cinder removing apparatus. The cinder is run directly from the furnace into pools of water and granulated, after which it is loaded by the McMyler machine to railroad cars and is used as ballast by the railroads.

At the Duquesne plant of the Carnegie Steel Co. the machinists have asked for an increase in wages. The day men want 10 hours' work with pay equal to earnings of 11 hours at 28 cents an hour. The night crew want their hours reduced from 14 to 13 with a corresponding advance.

The Pittsburg Filter Mfg. Co., Pittsburg, report the following recent sales of the Ideal system of water purification:

H. B. Camp Co., Greentown, O., 3 plants 300 h.-p. each; National Sugar Mfg. Co., Sugar City, Col., 3,000-h. p.; American Plate Glass Co., Pittsburg, 3,000 h.-p.; Manufacturers Natural Gas Co., Frankton, Ind., 1,500 h.-p.; Wickwire Bros., Cortland, N. Y., 1,000 h.-p.; Castalia Portland Cement Co., Castalia, O., 1,000 h.-p; Indiana Natural & Illuminating Gas Co., Indianapolis, Ind., 2,000 h.-p.; Alexandria Electric Light & Power Co., Alexandria, Ind., 1,000 h.-p.; West Virginia Pulp & Paper Co., New York, N. Y., 3,500 h.-p.; Nicholson File Co., Providence, R. I., 750 h.-p.; Eclipse Laundry Co., Pittsburg, Pa., 1,000 h.-p.

The Carnegie Tube Co. which was incorporated last week with a capital of $150,000 to engage in the tube manufacturing business at Carnegie, Pa., has awarded the contract for the erection of the steel buildings to the Wm. B. Scaife Co. of Pittsburg, and the S. R. Smythe Co. will install the heating



COCHRANE HEATER

Cochrane Feed-Water Heaters.

In many plants there are two waste products, through the use of which considerable economies can very often be effected. These are the heat in exhaust steam and the heat in the fuel gases.

Even if the conditions prevailing in the plant favor the use of an economizer, in almost every case it will be found of advantage to utilize exhaust steam for heating the water before it goes into the economizer, as these appliances are subject to expansion and contraction strains the same as boilers, if cold water is passed into them. They are also affected by scale formations and deposits pretty much the same as boilers, and they are more subject to corrosion through the action of the sulphur in the coal.

Besides, the **COCHRANE FEED-WATER HEATER AND PURIFIER** does some things that are not within the province of any other apparatus—it saves the condensed exhaust steam (which contains no scale-forming matter), it acts as a receptacle for all live steam drips coming through traps, and into it may also be brought the returns from heating or drying systems.

While economizers are of great advantage in many locations, they cannot do the work of or displace a **COCHRANE HEATER.**

HARRISON SAFETY BOILER WORKS,

Clearfield & 17th Sts., - - - - - - - - Philadelphia, Pa.

furnaces. Merchant pipe casing and boiler tubes ranging from ¼ inch to 12 inches will be manufactured. Officers have been elected as follows: A. A. Hutchinson, president; Reed M. Vincent, vice-president; Oscar F. Grant, treasurer, and Harry D. Nichols, secretary. The output of the plant will be about 100 tons daily.

Contracts were awarded this week for the erection of additions to the large plant of the American Ax & Tool Co. at Glassport, Pa. The contract price for the additions cost $200,000 and with the machinery will bring the cost to over $400,000. The buildings of the present plant are of brick, stone and steel and have a frontage of 415 feet. The additions when completed will give a frontage of 1,140 feet. To the several departments of the plant the following additions will be made: To the power plant, which at present is 80x96 feet an addition of the same size will be made. The machine shop which is 44x60 feet will be doubled in size; five new grinding rooms, each 55x150 feet, will be added to the present ones which are each 60x270 feet; four warerooms, each 60x150 feet, will be added to the three present ones which average 60x297 feet; three new forge shops will also be added each 60x150 to the two present shops. The structural iron work on the additions will be erected by the Fort Pitt Bridge Co. of Pittsburg and will be completed by Nov. 15. The combine manufactures all kinds of edge tools and during the past year, in its first year, the value of the output was estimated at more than $2,000,000. The main offices are in New York. W. C. Hubbard is president.

A number of concerns in Pittsburg have conceded to the demands of the striking boiler makers and it is probable that before the end of the week the men will all have returned to work. They are asking for an advance in the minimum wage from $2.50 to $3.

The William Tod Co. of Youngstown, O., has received an order from the Colorado Fuel & Iron Co. of Denver, Col., for three blowing engines similar in construction to those at the Ohio plant of the National Steel Co., at Youngstown. The new engines will be vertical steeple cross compound with 90-inch blowing tubes and 48 and 90 by 60 cylinders. They will be duplicates of the four built for this same company by the Wm. Tod Co. some time ago.

The citizens of Bowling Green, O., are endeavoring to raise a bonus to secure the removal of an Indiana Specialty Mfg. Co. to their city. The company manufactures all kinds of iron specialties.

The new pumping station built by the American Sheet Steel Co. in connection with its Muncie, Ind., plant has been completed. The installation cost $75,000.

The Radiant Home stove works of Erie, Pa., is endeavoring to locate a branch plant at some inland Illinois town. Several places have offered bonuses.

At a meeting of the stockholders of the Vulcan Iron Works of Wilkesbarre, Pa., held last week directors were elected as follows: A. H. Van Horn, M. W. Morris, Morris Williams, A. J. Davis, W. A. Lathrop, E. H. Jones, I. A. Stearns, T. H. Atherton, C. P. Hunt, Richard Sharpe, and Isaac Thomas. E. H. Jones was elected president and general manager; F. G. Smith, treasurer, and S. T. Nicholson, secretary. The directors declared a semi-annual 3 per cent dividend and a 40 per cent stock dividend, payable July 1. Authority was given to increase the capital stock from $200,000 to $1,500,000 when occasion requires.

The Youngstown, O., mills of the American Steel Hoop Co. during the month of May turned out more than 18,000 tons of finished material. The output is by far the largest since the erection of the mills.

The National Steel Co. has placed an order with the Pennsylvania Engineering Co. of New Castle, Pa., for a large steel converter for the Ohio plant located at Youngstown, O.

The Arcade Mfg. Co., of Freeport, Ill., announces that it has bought out the toy business of the Coleman Hardware Co., of Chicago, and is making all preparations to furnish these metal specialties to the trade.

It is probable that the tin plate plant projected by John

The Robert Field Company,

20 Hayden Building, COLUMBUS, OHIO.

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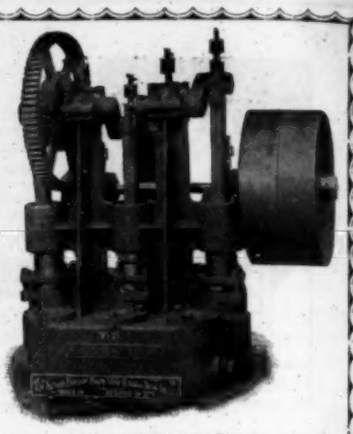


Triplex Boiler Feed Pump

IF INTERESTED ADDRESS

The Stilwell-Bierce & Smith-Vaile Co., 227 Lehman Street. DAYTON, OHIO, U. S. A.

E. Jones of East Chicago, Ind., may yet be located in Milwaukee. It is said that the bonus offered by Milwaukee citizens is the best yet offered.

The strike at the plant of the Reading Iron Co., Reading, Pa., continues. The strikers are now camping out in order to cut down the expenses of subsistence.

The Rock River Machine Co. located at Janesville, Wis., will shortly be compelled to increase the size of its plant. If additional ground cannot be secured at Janesville, it is probable that the plant will be removed to Rockford, Wis.

The Muskegon tin plate plant of the American Tin Plate Co. at Muskegon, Mich., is having a large amount of new machinery installed. The latest addition is a 15-ton shear.

CANADIAN PIG IRON IN ENGLAND.

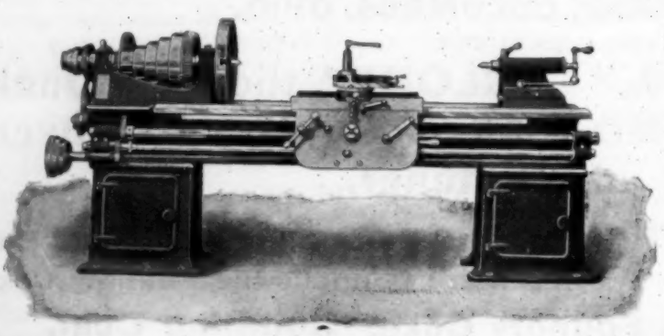
A notable event in the iron world, and of great interest otherwise, is the arrival in the Clyde this week of a cargo of 3,500 tons of pig iron from Canada. The quality corresponds with Cleveland iron, and is therefore suitable for foundry purposes. It comes across, we understand, at a freight of 10s. per ton, which is about the equivalent of half the bounty on export granted by the Dominion Government; and it incurs landing and other charges amounting to 5s. per ton, which closely approximates the cost of taking Cleveland iron to Scotland by sea. This Canadian product, then, enters into direct competition with Cleveland iron, which, again, displaces Scotch ordinary iron—at a price. The price at which the Canadian iron has been sold has not yet been disclosed, but Cleveland warrants are just now 8s. 6d. per ton under Scotch G. M. B., which is considerably more than the normal difference, so that the moment of arrival is not very opportune from the Canadian point of view.

The shipment marks a strange reversal in the current of trade, for Canada has been in the habit of taking about 10,000 tons of pig iron per annum from us, notwithstanding the contiguity of the United States. But it marks more than that. This iron comes from Cape Breton, Nova Scotia, where have just been completed four large blast furnaces for the smelting of iron ore conveyed at a low rate of freight, and on a short sea run of 24 hours or so, from the iron mines of Newfoundland. These mines are near the seaboard and are cheaply worked, so that the ore is one of the cheapest ironstones in the world. It is conveyed to Sydney, Cape Breton, for a fraction of the cost of conveying ironstone from Lake Superior to Pittsburg, or from Bilbao to Middlesbro' or Glasgow, and the furnaces in which it is smelted are right on a rich and cheaply worked coalfield on the seaboard. Here are being erected a plant of some 400 coke ovens and works for the manufacture of steel on a great scale. At Cape Breton the cost of the materials for the manufacture of a ton of iron is said to be only 3s. 3d. per ton, as against 13s. per ton at Pittsburg. The peculiar advantages under which this new Nova Scotian enterprise is being started are well understood in the United States, and the knowing ones in the trade there have for some time been predicting that the cheapest iron and steel in the world will in the future be produced in Canada. As to this we know not, but it is very evident that the first cost of iron smelted on the seaboard, with coal requiring no transport, must be much lower than anything the United States can show under present conditions of working.

Whether it will pay Nova Scotia better to export pig iron than to turn it into steel is another question. The one disadvantage under which Cape Breton must suffer is in the matter of freight, for we do not know what cargoes large steamers can get to induce them to go there for return cargoes of iron, and to go there in ballast must be, of course, to enhance the outward freights. In the meanwhile, however, it must pay the smelters handsomely to export pigs, because of the bounty, which bounty has been extended to 1907.

Sydney, C. B., in two years has increased its population nearly fourfold and is already called the Pittsburg of Canada.

SCHUMACHER & BOYE,



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It promises also to be the rival of our Middlesbro' and Birmingham. From a provincial village it has been converted into a busy manufacturing town. . . . Iron smelting is not quite a new thing there, but nothing has before been attempted on the present scale—favored in every way by the municipality, sanctioned and supported by the State Legislature, and endowed by the Dominion Parliament. Up till now Canada has not made more than about 90,000 tons of pig iron per annum. The new plant is equal to about 200,000 tons per annum.

This, of course, is a small thing compared with the United States, or with Cleveland, and is not very large even compared with Scotland. But it is only the beginning of an industry of immeasurable possibilities. This pioneer cargo sent to the Clyde may mark the beginning of a new epoch. The difficulties attending the supply of ore for our blast furnaces seem to become greater year by year. It is pleasanter to have to look to Canada for future supplies of crude iron than to the United States, even though the enterprise at Cape Breton is being developed at present by United States capital. The material, at any rate, is of British colonial origin.—[London Statist, May 11.

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Like one who climbs a tree and—hollers.

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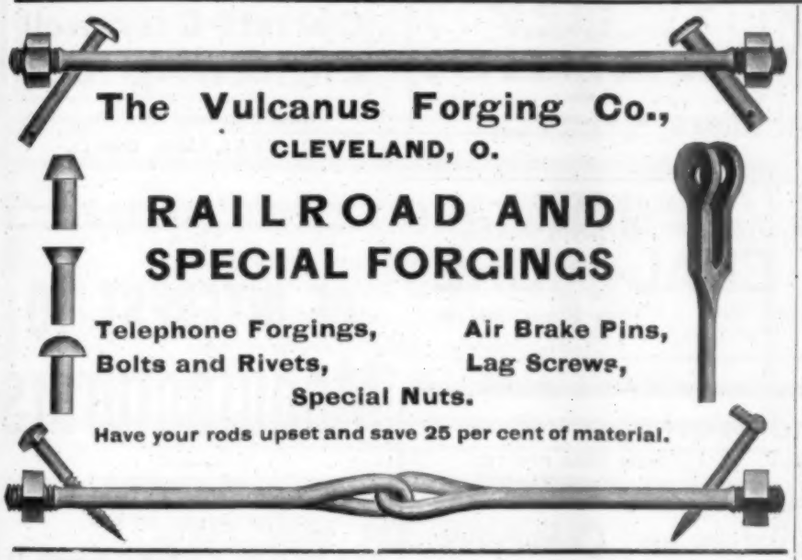

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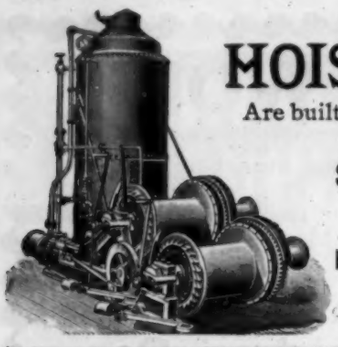

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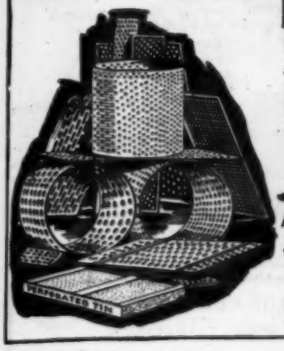

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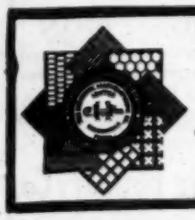

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Can be turned down from a full size flame to one candle power by means of the little valves, one of which may be closed entirely and the other one reduced to a flame as small as desired for a night light without smoking, carbonizing or producing a sluggish flame.

The diverging stems are so arranged that they can be turned into alignment in an instant.

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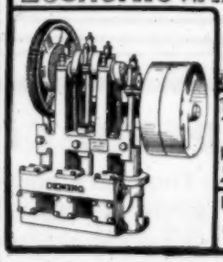

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15	13	11	Lorain Branch	10	14	16
P.M.	P.M.	A.M.		P.M.	A.M.	P.M.
4:00	1:05	7:00	Lorain	3:32	12:02	7:15
4:18	1:25	7:20	Elyria.....	3:14	11:45	6:59
4:36	1:53	7:43	Grafton	2:56	11:29	6:41
4:58	2:15	8:05	Lester Jun...	2:32	11:08	6:21

5	3	1	Main Line.	2	4	6
P.M.	P.M.	A.M.		A.M.	A.M	P.M.
5:10	1:35	7:50	Cleveland.....	9:50	12:00	6:00
6:20	2:31	8:27	Lester Jun...	8:48	11:07	5:00
6:31	2:40	8:36	Medina	8:36	10:59	4:48
6:54	2:59	8:57	Seville	8:14	10:40	4:26
7:00	3:04	9:03	Sterling	8:03	10:34	4:20
7:22	3:24	9:24	Warwick.....	7:41	10:13	3:56
7:30	3:32	9:31	Canal Fult'n	7:34	10:06	3:48
7:50	3:50	9:50	Ar. Dep. Massillon.	7:15 8 P.M.	9:50	3:30
7:50	3:50	9:50	Dep. Ar.	7:50	9:50	3:30
8:05	4:06	10:05	Justus.....	7:34	9:35	3:13
8:35	4:37	10:36	Canal Dover	7:03	9:05	2:44
8:42	4:44	10:43	New Phila....	6:55	8:58	2:37
9:00	5:01	11:00	Ar. Dep. Urichsville	6:38	8:40	2:20
7 A.M.						
7:30	5:10	11:10	Dep. Ar.	6:38	8:40	2:20
8:06	5:43	11:43	Freeport	6:00	8:06	1:44
		P.M.				
8:32	6:07	12:05	Flushing	5:34	7:42	1:20
9:40	7:05	1:05	Bridgeport...	4:30	6:45	12:20

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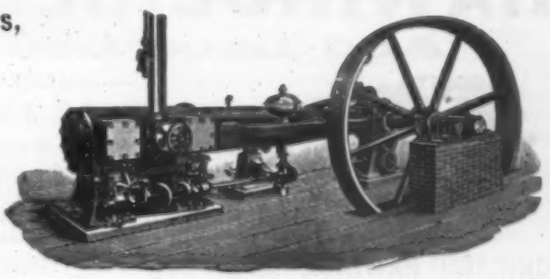

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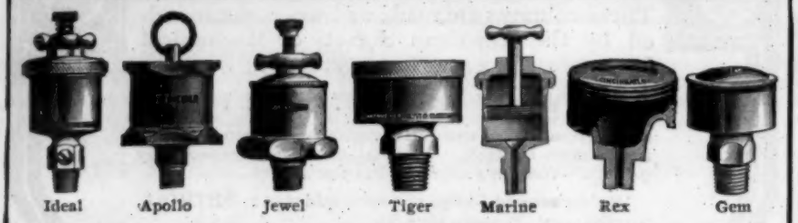

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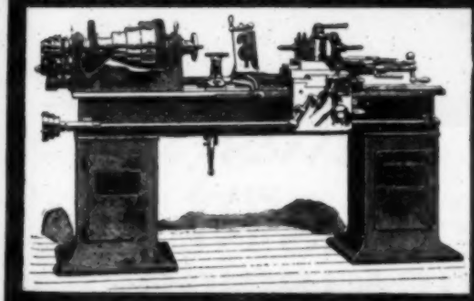

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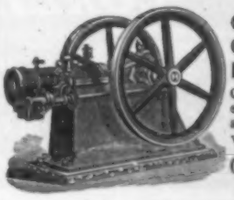

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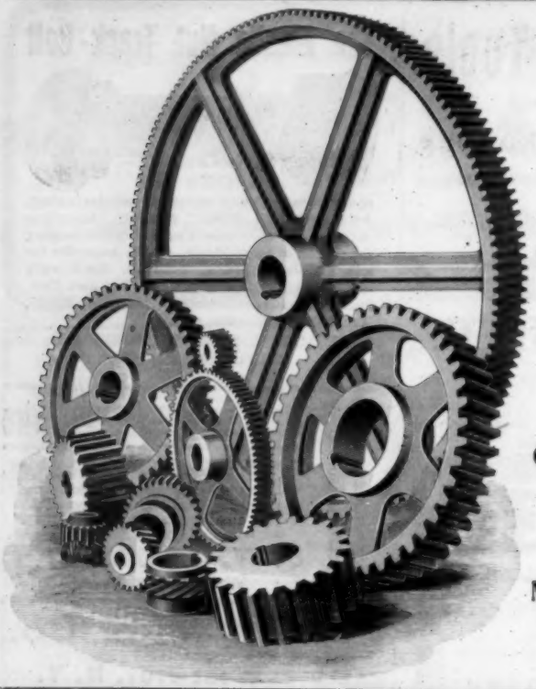

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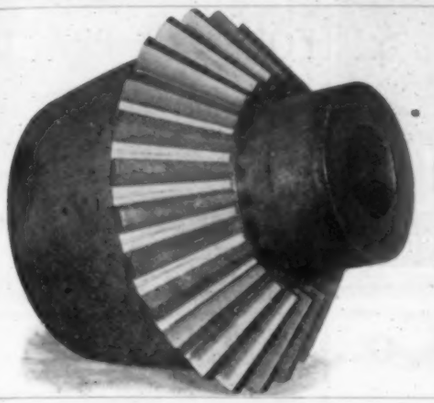

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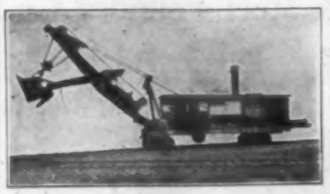

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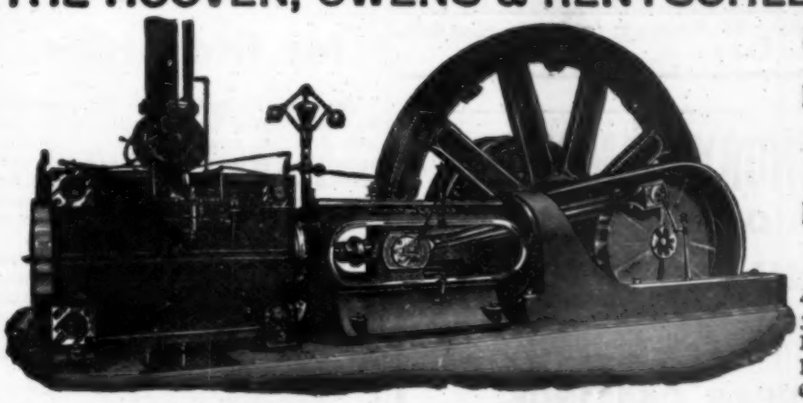

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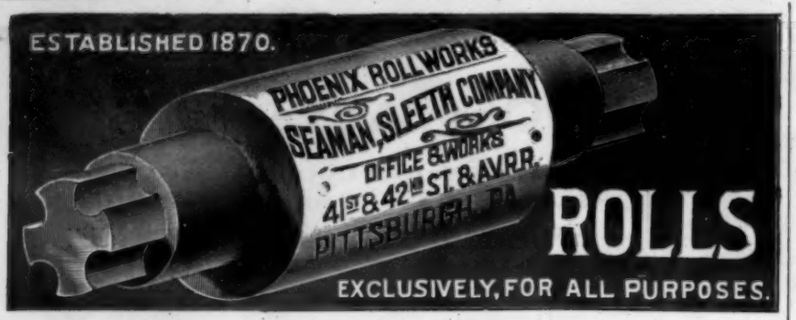

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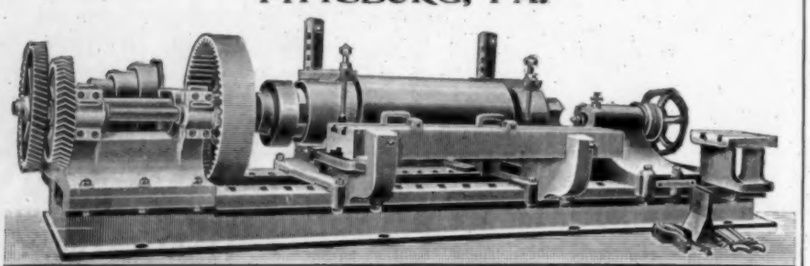

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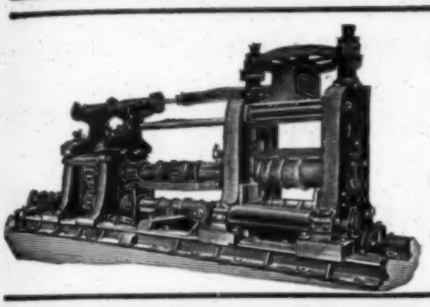

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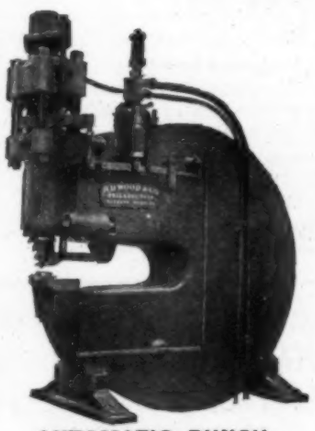
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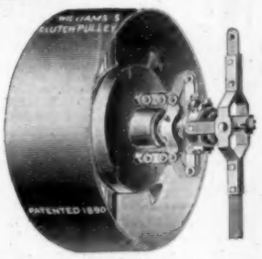

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